

## Age and Gender - Related Differences in Health Anxiety and Perceived Anxiety-Control Level among Patients with Acute Cardiac Syndrome

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**Abstract:** The experience of anxiety feelings about health condition has an omnipresent influence on life domains of younger and older adults, and takes place if various stressors (chronic disease dilemma, functional limitations, and physical disabilities) can exaggerate the disorder. Severe health anxiety result from acute cardiac episodes has significant negative impacts on well-being, social & occupational functioning and health care resources utilization. Investigating health anxiety in clinical medical practice populations with varied age categories and within gender differences provides an opportunity to understand how these sorts of difficulties may arise and be maintained as a result of health-related experiences. The aims of the study were to (1) identify age and gender - related differences in health anxiety and anxiety-control levels among patients with acute cardiac syndrome; (2) determine the relationship between participants' perceived anxiety control level and degree of health anxiety. This study had been conducted at cardiology inpatient department affiliated to General Alexandria Main University Hospital, Egypt. A total of 80 male and female younger and older adults' hospitalized patients with documented acute cardiac episode. Data were collected through four: Socio-demographic and clinical data structured interview schedule, The Short Health Anxiety Inventory (18-item SHAI), Illness Attitudes Scale-27, and Anxiety Control Questionnaire (ACQ). According to SHAI, total mean percent score of those <60 was  $44.31 \pm 17.31$  compared with  $35.14 \pm 21.28$  of those  $\geq 60$ . younger adult females experienced more health anxiety during their acute cardiac episodes in a significant degree than older females. Age and gender statistical significant differences concerning levels of anxiety control of study participants was emerged. There is an inverse relationship between patients' perceived level of anxiety control and their health-related anxiety. Studied older adults in the current study demonstrated lower levels of health anxiety in comparison with the studied younger adults According to SHAI. The same finding was confirmed using Illness Attitude Scale. Moreover, the current study determined that a higher level of perceived anxiety control was associated with lower level of health anxiety based on both SHAI and illness attitude scale which is incomparable results to this study. Age and sex significant differences regarding perceived control and health anxiety between participants in both groups were also detected. Health anxiety screening should be established as a routine screening measure for both younger and older adult's patients in clinical settings. Level of anxiety control, age and gender differences must be considered when planning health anxiety interventions.

**Keywords:** younger and older adults, health anxiety, anxiety control, acute cardiac syndromes

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### I. Introduction

Globally, cardio-pathological conditions especially acute cardiac episodes are ranked the first by the World Health Organization in mortality prevalence among younger and older adults, accounting for 30% of all worldwide deaths, in spite of the surveillance and dominance of the main risk factors<sup>(1,2)</sup>. One of the excluded non- studied risk factors without reasonable cause; is psychological status that act as a double – edged weapon in either the development of cardiac diseases or the negative influence those diseases burden on patients' prognosis, treatment, health care needed, and overall daily livings<sup>(3)</sup>. In 2014, the American Heart Association recommended that cardiac patients must be screened routinely for only depression which stated as a risk factor for multiple acute cardiac syndromes with obvious ignorance of anxiety disorders and its enormous types especially health anxiety<sup>(4)</sup>. Health anxiety (HA) disorders (one example is hypochondriasis (HC) which is the extreme and persistent type of health anxiety), according to the American Psychiatric Association [APA] (2000), DSM-IV-TR; defined as the preoccupied fearful thoughts or beliefs of impending untreatable imminent

deteriorated illness sorted from suspicious, obsessive, apprehensive or somber presages of bodily sensations or symptoms.<sup>(5)</sup> Health anxiety encompasses cognitive and behavioral hallmarks. Disease conviction (a belief that one has a serious illness) represents the core cognitive feature of this discrete psychiatric disorder, in which patients with health anxiety persistently preoccupied with the idea of and fear from having serious untreated condition; which pushed the mind to misinterpret or hyper-vigilance any bodily sensations and autonomic nervous system arousal, or expect untruthful incidence of complications which usually accompanied with other dysfunctional beliefs<sup>(6)</sup>.

As a protection to get rid of panic ideas, patients exhibits maladaptive coping behavioral strategies through rotating between different consultants and clinics with demonstration of multi-safety and health-seeking behaviors as frequent checkups and browse for explanation of confusing symptom which, in most cases, unneeded. The results are often a vicious cycle of error investigations, unbelievable reassurance and repeated or unnecessary consultation which provoking further fears and distress, unresolved symptoms presentations, economic burden, social dysfunction, long-term disability and suffering, impairment in occupation and other areas of functioning with expectation of early mortality despite adequate medical evaluation. This specifies that the persistence of health anxiety is a result of processes that maintain the catastrophic interpretations from which anxiety arises<sup>(7)</sup>.

To diagnose health anxiety disorders, the new fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (2013)<sup>(8)</sup>, replaced hypochondriasis by illness anxiety disorder (focuses on anxiety about health, deemphasizes somatic symptoms which may not present or only mild in intensity, and requires maladaptive behavior either excessive health-related behaviors or avoidant behaviors) and somatic symptom disorder (diagnosed when patients present with one or more prominent somatic symptoms accompanied by excessive cognitive, affective or behavioral responses to somatic symptoms or associated health concerns). However, there is little empiric research to support these changes. Medical diseases included as a criteria of diagnosis in this edition which was previously excluded. In spite, fearful and worrying assault of health anxiety and that of cardiac illness share nearly comparable if not homogenous syndromes, notwithstanding, careful and accurate inspection can differentiate actual diagnosis<sup>(9)</sup>. Real cardiac disorders in the non health-anxious character lead to radiated chest pain, irreversible main organs damage, being fatal, correlated with fainting sensation, and affected unhealthy vulnerable individuals per- se. This picture is absent in health anxiety related to or not related to cardiac dysfunction which controversially prevail localized chest pain, no end-organ damage, not fatal and display in both healthy and unhealthy individuals with controllable medical condition<sup>(10)</sup>.

The experience of anxiety feelings about health condition has an omnipresent influence on life domains of younger and older adults, and takes place if various stressors (chronic disease dilemma, functional limitations, and physical disabilities) can exaggerate the disorder<sup>(11)</sup>. Both groups of adults, younger and older, have several etiologies in common, however older adults face more significant losses combined with loss of independence and productivity in addition to debilitating conditions with deteriorating ability to cope with, such as, acute cardiac syndromes<sup>(12)</sup>. Between 15% to 24% of patients attending general hospital medical clinics have some form of undetected health anxiety of varied levels with inconsistent incidence rate between younger and older adults<sup>(13)</sup>. Approximately 6% of people report experiencing a significant degree of health anxiety in their lifetime<sup>(14)</sup>. In addition, the study of Berge et al (2016)<sup>(15)</sup> found that 6.1% of those with health anxiety developed coronary artery diseases in comparison to 3.0% of non-patients. After adjustments for established cardiovascular risk factors, about 70% increased risk of heart diseases was found among patients with health anxiety. Although thorough researches confirmed high prevalence of health anxiety disorder in older adults compared with their younger counterparts, yet poor exploration in later life perhaps because of the absence of diagnostic criterion specific to this age-group<sup>(12)</sup>.

Health anxiety is a limited researched topic in the Egyptian community with no previous studies, to the best of our knowledge, investigated this important area between younger and older adults before; its relation to perceived anxiety control and in clinical medical setting. Our research is the first even in the Arab World and the Middle East. The appreciation in studies, if present, focused around studying the hypochondriacal characteristics among younger adults<sup>(16)</sup> or the generalized anxiety disorders of different diagnosis among patients of various age groups<sup>(17)</sup>. Poor diagnosis of health anxiety in general is attributed to the fact that healthcare is directed mainly to the management of physical sufferings and medical staff rarely used adequate self-rating scales for measuring various anxieties especially in cardio-pathology units<sup>(18)</sup>.

In accordance with the cognitive-behavioral approach, perception of a health threat among younger and older cardiac patients is confirmed mainly by assessing the awareness of the negative consequence of the disease, estimating the disease likelihood, and evaluating the disease severity, impaired coping behaviors and insufficient medical care. This comprehension converge on the degree misinterpretations of this health- related information produce a certain pattern of rebuttal such as anxiety (affective changes), physiological symptoms and arousals (catastrophic interpretations of health-relevant information), safety-seeking actions (over reassurance or even

avoidance), attempts to attain certainty about health status, selective attention and subsequent functional impairment<sup>(19)</sup>.

Nurses have a pivotal role in the management process of illness related anxieties by helping the health anxious patients actively explore dysfunctional beliefs about somatic symptoms, correct negative cognitive schemas of erroneous assumptions about health and illness, and incorporate a broad range of cognitive and behavioral procedures. These include education and discussion about the aspects of the problem and the meaning of symptoms to be reinterpreted and attributed to less threatening cause (cognitive restructuring), medical interventions, use of diaries to record negative thoughts and rational responses; response prevention for bodily checking and reassurance seeking; participation in treatment by significant others involved in providing reassurance; and exposure to previously avoided illness-related situations<sup>(20,21)</sup>.

Perception of the ability of younger and older adults has in controlling health- related anxieties is an important coping component of health anxiety management and treatment implications in terms of effectively terminating negative affective states<sup>(22)</sup>. Anxiety as described by Barlow (2002)<sup>(23)</sup> involved a cognitively-affective relation in which uncontrollable and unpredictable feelings about threatening situations aroused because of the uncertainty that one capable to deal effectively and intervene such threats. For ease explanation, perceived anxiety control, in its broad dimension as termed by Rapee et al., (1996)<sup>(24)</sup>, points out the range of person's internal believe of having initial capabilities to accomplish control over or react to outstanding endogenous or exogenous situations. Effective dealing with stressful unpredictable events and the possession of coping- initiated character shaped the individual differences in anxiety experience and tolerance. Although important for all, reduced self-perception of controlling illness-associated events may be a particular important concept in relation to medical inpatients<sup>(25)</sup>. The level of perceived control experienced by hospitalized patients with acute cardiac syndromes is objectively diminished by factors such as ambiguous of treatment followed, uncertainty of investigation results, changing/ unfamiliar environment, cost burden, and family reaction or support<sup>(26)</sup>. Because clinical observations suggested that health anxiety is often exacerbated in situations marked by high stress and elevated emotional arousal, health anxiety might be associated with deficits in anxiety – control or adopting maladaptive plans<sup>(27-29)</sup>. Little is searched about the age and gender related differences in the realm of health anxiety and related perceived anxiety-control level. So, the current research aimed at broadly exploring this issue and shed some light on possible relationships between dimensions of health anxiety among younger and older adults and anxiety- regulation strategies used. This would help the gerontological and medical surgical nurses to provide a specifically tailored health education regarding prevention and early identification and treatment of such hidden unnoticed problem.

### **1.1 Aim of the study**

The aims of the study were;

First, to identify age and gender - related differences in health anxiety and anxiety-control levels among patients with acute cardiac syndrome.

Second, to determine the relationship between participants' perceived anxiety control level and degree of health anxiety.

### **1.2 Significance of the study:-**

Because the present study was one of the first to compare and examine the relation between anxiety control and health anxiety among younger and older adults' patients with cardiovascular diseases in Egypt, data generated from this study about age and gender differences in relation to the researched parameters will help in developing of tailored nursing care interventions and screening tools in order to acknowledge and manage health related anxieties and concerns

### **1.3 Research Questions:**

- 1- Are there age and gender differences in relation to health anxiety?
- 2- Are there age and gender differences in relation to perceived anxiety control level?
- 3- Is there a relation between perceived anxiety control level and health anxiety among younger and older patients with acute cardiac syndrome?

## **II. Materials And Method**

**2.1 Research Design:** A descriptive comparative approach was adopted to carry out this study

**2.2 Research Setting:** This study had been conducted at cardiology inpatient department which is affiliated to General Alexandria Main University Hospital. This hospital is a multi-campus medical building and among the largest university hospitals in Alexandria, Egypt, serving a large number of patients. The capacity of the inpatient department is 39 beds for male and 22 beds for female cardiology younger and older patients. This

previous mention setting works 7 days/week, 24 hours/day and selected because of the highly admission rate among both cardiac-diseased younger and older adults patients; increased turnover of patients with different socioeconomic background; and receives patients from all over the governorate and others.

### **2.3 Subjects:**

- A total of 80 (40 males and females younger adults i.e. 18 yrs – less than 60 yrs and 40 males and females older adults i.e. 60 yrs to 85 yrs) hospitalized patients attending cardiology inpatient department at General Alexandria Main University Hospital with documented acute cardiac episode, those with follow-up appointments, re-attending the inpatient department with a new problem and/or undergoing revascularization and met the following criteria and agreed to participate, were enrolled in the study.

- To reduce the impact of high levels of health anxiety due to overestimation of variables relevant to cardiac abnormalities (false positive results), participants newly admitted to the inpatient department (less than one week) and those with more than 12 months incident/ history of cardiac disorders were excluded. In addition, participants had communication problems, with a current or past history of psychotic or mental illnesses were all turned out.

- The sample size calculated using Epi-info 7 based on the following parameters (Target population size= 350 per 3 months, Expected frequency= 50%, Acceptable error= 10%, Confidence coefficient= 95%, Sample size= 75, Power analysis= 80%). The minimum required after adding 10% for defaulter subjects 40 male and female younger and older adults per each age and equally distributed gender- group. The study subjects were selected by the non-probability sampling technique (purposive sampling). During data collection, male and female younger and older adults attending the previously mentioned setting were selected and divided equally into two age-groups; each has an equal number of male and female participants with post- acute cardiac episode.

### **2.4 Data Collection Tools**

#### **Tool I: Socio-demographic and clinical data structured interview schedule**

It was developed by the researchers after reviewing literature and included two parts:

**Part I:** Data about younger and older patients includes their socio-demographic characteristics as age, level of education, marital status, and availability of adequate income. Exploration of health history included the history of cardiac abnormalities, other comorbidities, and previous hospital admission.

**Part two:** Entails the effect of cardiac health-related anxiety on patients' diverse aspects of life and the avoidance and/or health safety-seeking behaviors that health- anxious patients may use:

#### **a. Safety – seeking behaviors**

- Engage in seeking medical attention (multiple checking and doctor visit)
- Repeated requests for investigations
- Reassurance seeking from family members/friends
- Continuous self-exam/ frequent body scanning

#### **b. Avoidance behaviors**

- Avoidance of hospitals and medical professionals (because of fear of finding something wrong)
- Avoid reading or listening to news about the disease.
- Restrict social relations making priority to the disease
- Avoid any situation can exacerbate symptoms of the disease.

#### **Tool II: The Short Health Anxiety Inventory (18-item SHAI)**

Developed based on the work of Salkovskis, Rimes, Warwick, and Clark (2002)<sup>(30)</sup> as a diagnostic tool for screening patients with the basic cognitive and behavioral features of health anxiety including the respondents' worry level about health, orientations to somatic sensations or abnormalities, and feared sequences of experiencing an illness. Primarily, those authors developed the Health Anxiety Inventory (HAI; 64- item version) and a shortened or abbreviated 2 versions or forms of this scale, the Short Health Anxiety Inventory (SHAI; 14- item version and 18- item version), the latest became the most desirable and popular measure of health anxiety in most researches as it distinguished between normal levels of health concern (mild health anxiety), moderate health anxiety, and severe health anxiety (hypochondriasis; severe maladaptive irresponsive emotions for extensive period of time accompanied with clinical level of impairment). Each item of the 18- item SHAI consists of a strata of four statements in a multiple-choice format (four-point rating scale where: 0: no symptoms, 1: mild symptoms, 2: moderate symptoms and 3: extreme symptoms, clinical form of hypochondriasis) and the respondents asked to select the best answer reflects their emotions over the past 6 months. The authors' recommendation is followed, as participants in this study are asked to reflect their feelings over a shorter period of time (i.e. past week not past 6 months as it concerns with monitoring the treatment process). Two main components were delivered by the authors, to estimate the magnitude of health anxiety: (1) illness likelihood (IL), i.e. the perceived likelihood of acquiring a serious illness, intrusive thoughts, and body vigilance and (2) negative consequences of an illness (NC), i.e. catastrophic beliefs about the anticipated burden

of having a serious illness. More recent scale factors were utilized in the current study, those developed by Abramowitz et al. (2007)<sup>(31)</sup> which declared 3 factors, factor I labeled “Illness Likelihood”, composed of 10 items, concerned with the perceived likelihood or the tendency to worry about the possibility of acquiring a serious illness and intrusive thoughts about health. Factor II labeled “Illness Severity”, consisted of the last four SHAI items, assessed the anticipated burden or negative results and valence of becoming ill. The third factor labeled “Body Vigilance,” consisted of (3 or 4 items) and assess attention to bodily sensations or changes. Subjects responded for each statement as a zero to three item scores; then they are summed to obtain the total score which ranged from zero to fifty four. A score of 27 is utilized as an optimal cut-off score or an appropriate threshold for the diagnosis of significant health anxiety and its severe form in clinical settings (Rode et al., 2006)<sup>(32)</sup>.

**Tool III: Illness Attitudes Scale-27 (IAS; Kellner, 1986, Kellner et al., 1987)** <sup>(33,34)</sup>

The IAS originally involved as a self- report inventory contains 29 questions divided into 9 main dimensions or subscales assesses fears, attitudes, beliefs, behaviors, and effects related to hypochondriasis, HA and abnormal illness behavior. The responses were measured using a 5- point rating scale for 27 items while the other two items are answered differently. 24 items out of 27 measured using 0–4 Likert scale ranging from most of the time (4) to no (0) while the three remaining items; answers adjusted according to the type of questions (fill in the blank format). For the purpose of this study, the four- factor version of the scale developed by Ferguson and Daniel (1995)<sup>(35)</sup> was used. The 27-itemed questions grouped into 4 factors/dimensions (compared to 9 in the original scale): (1) General Hypochondriacal Fears and Beliefs (12 items): higher scores on this dimension reflect increased feelings of concern, worry and fear about illness. (2) Symptom Experience and Frequency of Treatment (7 items): higher scores were interpreted as both an increased frequency of visits to a variety of health care professionals and that bodily symptoms interfered with normal daily activities. (3) Thanatophobia (4 items): higher scores demonstrated increased fear of and preoccupation with death. (4) Coronary Heart Disease (CHD) and Associated Health Habit (4 items): higher scores pointed out the avoidance of harmful life style behaviors associated with increased higher risk of heart disease development, giving less tendency heart diseases- related worries or worries about bodily sensations in conclusion. 27 of the 29 items are used in the total score, 2 items didn’t contribute to the total score of the IAS scales as they included to gain additional information (those asking about what illness your doctor told you that you have; or what treatment you currently consume). IAS total scores were computed by summing each item which ranges from 0 to 108. The higher the score is, the higher the abnormal illness behaviors, worry about illness and hypochondriasis beliefs patients had. Optimal cut-offs for the diagnosis on the IAS is 47 (Hedman et al., 2015)<sup>(36)</sup>.

**Tool IV: Anxiety Control Questionnaire (ACQ, Rapee et al., 1996)** <sup>(24)</sup>

Consisted of a 30-item reflected the respondents’ perceived ability making control over, cope with and emotionally react to anxiety-provoking situations and internal and external threatening events, including bodily sensations. Scoring of the items is made using a 6-point Likert-type scale from zero (strongly disagree) to five (strongly agree). The ACQ yields two factors; control over internal reactions and control over external events; which based on the factor analysis by Rapee and colleagues (1996)<sup>(24)</sup>. For the purpose of the current study, researchers used the four-factor developed by Gerolimatos et al., (2012)<sup>(37)</sup>. Factor I labeled “External Lack of Control,” described exogenous threats/situations perceived as out of respondent’s control. It contained 10 items (items No 2, 7, 8, 14, 15, 16, 20, 23, 28, 30). Factor II titled “Internal Control”, described the respondents’ control over endogenous events, such as worrisome thoughts and physiological arousal. It comprised eight items (items No 1, 4, 10, 11, 12, 13, 17, 29). Factor III labeled “Internal Lack of Control,” described the respondents’ inability to control internal processes. It contained 7 items (items No 3, 5, 6, 9, 24, 25, 26). Factor IV named “Effective Coping”, centered on the ability to cope with anxiety- moderating and arousal situations. It contained 5 items (items No 18, 19, 21, 22, 27). The total score of ACQ is 150 and is classified as follows: (0- <25) very low control of and cope with anxiety- exaggerated situations, (25- <75) low controlling and coping level, (75- <125) moderate controlling and coping level, and ( ≥125) high controlling and coping level. Higher scores indicate greater perceived control and coping abilities. For the 18 reverse-worded items (items No 2, 3, 5, 6, 7, 8, 9, 14, 15, 16, 18, 20, 23, 24, 25, 26, 28, 30), reverse scoring was put into consideration. Thus, the negatively-framed questions should be reversed and transformed to positively-framed questions such as (0=5), (1=4), (2=3), (3=2), (4=1), and (5=0) before data coding.

## **2.5 Procedure Methodology:**

The study was executed according to the following steps

1. A written approval of responsible authorities (the general director of the Alexandria Main University Hospital and the director of the chosen setting) was obtained through an official letter from the Faculty of Nursing.
2. Meeting was held with directors of the selected setting to clarify the purpose of the study and to gain cooperation and support during data collection.
3. Study tool I (Socio-demographic and clinical data structured interview schedule) was developed by the researchers after reviewing the relevant literature.
4. The researchers translated the study tools II (The Short Health Anxiety Inventory), III (Illness Attitudes Scale), and IV (Anxiety Control Questionnaire) into their mother language (Arabic). ( $\alpha$ ) Cronbach's statistical test for internal consistency of tool items, was used on a sample of 8 subjects to ascertain the reliability of the tools and found to be (0.894), (0.862), and (0.907) respectively for tool II, III, and IV, indicated an acceptable reliability for the tools.
5. The study tools validated by juries of (3) experts in the fields (Medical- surgical, Gerontological and Psychiatric and Mental Health Nursing Departments); their suggestions and recommendations were taken into considerations.
6. Pilot study was carried out on 8 patients not included in the study sample (4 from each age group, divided again equally according to gender) who were randomly chosen from a medical unit other than that used in the current research namely, "Liver and Gallbladder Unit" in order to ascertain the relevance, clarity and applicability of the tools and test wording of the questions, also to estimate the approximate time needed to complete the study tools. Based on the obtained results, the necessary modifications were done.
7. The questionnaire completeness was carried out over a 14-week period through individualized interview to be filled depending on the degree of understanding and response of the patient. The interview held in about 30 minutes. Data collected by the researchers three days per week on Sundays, Tuesdays, and Thursdays from 9 am to 1 pm for a period of three months and half from July 2017 to the mid of October 2017. This is done after the approval of ethical research committee was obtained.

## **2.6 Ethical considerations:**

- Informed written or oral consents (according to education level) were obtained from the patients after brief explanation of the purpose and nature of the research.
- The anonymity and confidentiality of responses, voluntary participation and right to refuse to participate in the study were emphasized to patients.

## **2.7 Statistical analysis:**

After data were collected, they were coded and transferred into specially designed formats so as to be suitable for computer feeding. Following data entry, checking and verification processes were carried out to avoid any errors during data entry and manual revision were all used to detect any errors. Data of the obtained result were tabulated and presented in frequency distribution tables. Data analysis was carried out by computer using the SPSS version 20. Correlations were tried in between the essential studied parameters. The statistical analysis included: the mean, standard deviation, chi-square, fisher exact test (FET), Post Hoc Test (Tukey) and Monte Carlo test. The level of significance for the study was  $p \leq 0.05$ .

## **III. Results**

**Table (1): Percentage distribution of patients in both groups according to socio-demographic data,** the results revealed that there is no statistical significance difference between the two studied groups (<60 and  $\geq 60$ ) regarding social status, education level, the current work status or before retirement and monthly income ( $P= 0.071, 0.396, 0.822, 0.330$  respectively). The only observed differences between both groups were found among female gender of both groups where illiteracy and not enough income were more prevailing among female older adults comparing with their counterparts ( $p= 0.003$  and  $0.047$  respectively). Another statistical difference is observed between males and females in each age group regarding the current work status or that before retirement.

**Table (1): Percentage distribution of patients in both groups according to socio-demographic data (n = 80)**

Socio-demographic data	Age								$\chi^2$ (p <sub>2</sub> )	$\chi^2$ (p <sub>3</sub> )	$\chi^2$ (p <sub>4</sub> )
	<60 (n = 40)				≥60 (n = 40)						
	Male (n = 20)		Female (n = 20)		Male (n = 20)		Female (n = 20)				
	No.	%	No.	%	No.	%	No.	%			
<b>Social status</b>											
Single	3	15.0	1	5.0	0	0.0	0	0.0	3.575 ( <sup>MC</sup> p=0.219)	1.870 ( <sup>MC</sup> p=1.000)	5.374 ( <sup>MC</sup> p=0.071)
Married	16	80.0	19	95.0	17	85.0	19	95.0			
Widow	1	5.0	0	0.0	3	15.0	1	5.0			
$\chi^2$ (p <sub>1</sub> )	2.121 ( <sup>MC</sup> p=0.344)				1.111 ( <sup>FE</sup> p=0.605)						
<b>Education level</b>											
Illiterate	8	40.0	12	60.0	5	25.0	20	100.0	1.870 ( <sup>MC</sup> p=0.535)	8.807 ( <sup>MC</sup> p=0.003*)	4.227 ( <sup>MC</sup> p=0.396)
Basic education	4	20.0	3	15.0	3	15.0	0	0.0			
Moderate	1	5.0	2	10.0	4	20.0	0	0.0			
Secondary	5	25.0	3	15.0	4	20.0	0	0.0			
University	2	10.0	0	0.0	4	20.0	0	0.0			
$\chi^2$ ( <sup>MC</sup> p <sub>1</sub> )	3.522 (0.545)				22.944* (<0.001*)						
<b>Working now/ before retirement</b>											
Employee	5	25.0	1	5.0	7	35.0	1	5.0	1.985 ( <sup>MC</sup> p=0.511)	0.485 ( <sup>MC</sup> p=1.000)	0.391 (0.822)
Housewife	2	10.0	18	90.0	0	0.0	18	90.0			
Worker	13	65.0	1	5.0	13	65.0	1	5.0			
$\chi^2$ ( <sup>MC</sup> p <sub>1</sub> )	27.302* (<0.001*)				37.039* (<0.001*)						
<b>Monthly Income</b>											
Enough	2	10.0	5	25.0	4	20.0	0	0.0	0.784 ( <sup>FE</sup> p=0.661)	5.714 ( <sup>FE</sup> p=0.047*)	0.949 (0.330)
Not enough	18	90.0	15	75.0	16	80.0	20	100.0			
$\chi^2$ ( <sup>FE</sup> p <sub>1</sub> )	1.558 (0.407)				4.444 (0.106)						

p<sub>1</sub>: p value for comparing between male and female in each age group  
 p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group  
 p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group  
 p<sub>4</sub>: p value for comparing between <60 years and >60 years in total  
 $\chi^2$ , p:  $\chi^2$  and p values for Chi square test  
<sup>MC</sup>p: p value for Monte Carlo for Chi square test  
<sup>FE</sup>p: p value for Fisher Exact for Chi square test  
 \*: Statistically significant at p ≤ 0.05

**Table (2): Percentage distribution of patients in both groups according to their health status** The results showed that there is no statistical significance difference between the two studied groups regarding presence of cardiovascular diseases, years since diagnosis, previous hospitalization as well as causes and frequency of previous hospitalization ( P= 0.528, 0.536, 0.823, 0.345, 0.738 respectively).

**Table (2): Percentage distribution of patients in both groups according to their health status (n = 80)**

Health status	Age								$\chi^2$ (p <sub>2</sub> )	$\chi^2$ (p <sub>3</sub> )	$\chi^2$ (p <sub>4</sub> )
	<60 (n = 40)				≥60 (n = 40)						
	Male (n = 20)		Female (n = 20)		Male (n = 20)		Female (n = 20)				
	No.	%	No.	%	No.	%	No.	%			
<b>Cardiovascular disease:</b>											
Coronary heart disease	10	50.0	9	45.0	9	45.0	9	45.0	0.503 ( <sup>FE</sup> p=1.000)	1.831 ( <sup>FE</sup> p=0.412)	1.276 (0.528)
Heart failure	1	5.0	6	30.0	2	10.0	9	45.0			
Others (HTN, valvular problems)	9	45.0	5	25.0	9	45.0	2	10.0			
$\chi^2$ (p)	4.592 ( <sup>MC</sup> p=0.113)				8.909* (0.012*)						
<b>Years since diagnosis:</b>											
< 5 years	15	75.0	14	70.0	13	65.0	11	55.0	0.885 ( <sup>MC</sup> p=0.884)	1.592 ( <sup>MC</sup> p=0.520)	1.454 ( <sup>MC</sup> p=0.536)
5 – 10 years	3	15.0	0	0.0	3	15.0	1	5.0			
≥ 10	2	10.0	6	30.0	4	20.0	8	40.0			
$\chi^2$ ( <sup>MC</sup> p)	4.542 (0.085)				2.393 (0.288)						
<b>Other health problems:</b>											
Yes	12	60.0	15	75.0	17	85.0	16	80.0	3.135 (0.077)	0.143 ( <sup>FE</sup> p=1.000)	2.400 (0.121)
No	8	40.0	5	25.0	3	15.0	4	20.0			

$\chi^2(p)$	1.026 (0.311)				0.173 ( <sup>FE</sup> p=1.000)						
<b>Previous hospitalization:</b>											
Yes	10	50.0	12	60.0	12	60.0	9	45.0	0.404	0.902	0.050
No	10	50.0	8	40.0	8	40.0	11	55.0	(0.525)	(0.342)	(0.823)
$\chi^2(p)$	0.404 (0.525)				0.902 (0.342)						
<b>Causes for previous hospitalization:</b>											
Heart disease	10	100.0	11	91.7	10	83.3	8	88.9	1.883	0.046	1.208
Others causes	0	0.0	1	8.3	2	16.7	1	11.1	( <sup>FE</sup> p=0.481)	( <sup>FE</sup> p=1.000)	( <sup>FE</sup> p=0.345)
$\chi^2(^{FE}p)$	0.873 (1.00)				0.130 (1.000)						
<b>Frequency for previous hospitalization</b>											
1 – 3 times	9	90.0	12	100.0	10	83.3	9	100.0	1.072		1.253
4 – 6 times	1	10.0	0	0.0	1	8.3	0	0.0	( <sup>MC</sup> p=1.000)	–	( <sup>MC</sup> p=0.738)
7 – 10 times	0	0.0	0	0.0	1	8.3	0	0.0			
$\chi^2(p)$	1.257 ( <sup>FE</sup> p=0.455)				1.553 ( <sup>MC</sup> p=1.000)						

p<sub>1</sub>: p value for comparing between male and female in each age group  
 p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group  
 p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group  
 p<sub>4</sub>: p value for comparing between <60 years and >60 years in total  
 $\chi^2$ , p:  $\chi^2$  and p values for Chi square test <sup>MC</sup>p: p value for Monte Carlo for Chi square test  
<sup>FE</sup>p: p value for Fisher Exact for Chi square test  
 \*: Statistically significant at p ≤ 0.05

**Table (3): Percentage distribution of patients according to the impact of self-reported cardiac syndromes related- worry on social, psychological and economic status of patients.** The results found that there is a statistical significance difference between the two studied groups concerning performance of self-care activities, feeling with sadness and worry not present at past, feeling with more burdens on others and the preferred hobbies affected with disease (p= 0.044, 0.007, 0.026, 0.045).

Moreover, there is a statistical significance difference between females <60 years and females ≥60 years regarding performance of self-care activities and feeling with sadness and worry not present at past (P= 0.010, 0.028 respectively), where the majority of females ≥60 years (80%) cannot perform self-care activities in comparison to 40% of females <60 years. In addition to, the majority of females <60 years (90%) feel with sadness and worry not present at past in comparison with 60% of females ≥60 years.

The results found that, there is a statistical significance difference between male and female <60 years in relation to psychological acceptance of the disease, experience of disability compared to others in the same age group, and affection of patients’ social relations with the disease where the majority of females accept the disease psychologically, experience of disability and the disease affect their social relations and mental abilities (90%, 100%, 100%, 85% respectively) in comparison to (60%, 55%, 65%, 25% respectively) of male patients.

In addition, there is a statistical significance difference between males and females ≥60 years concerning performance of self-care activities, feeling with more burden on others, and affected mental abilities with the disease, as an equal percentage of females (80%) cannot perform self-care activities and feel with more burden on others and 75% had affected mental abilities, in comparison to (35%, 40%, 15% respectively) of male patients.

Regarding safety-seeking and avoidance behaviors, a statistical significance difference is found between the two studied groups concerning a repeated requests for laboratory investigations and continuous self-exam (P= 0.026, 0.024 respectively); in addition to restriction of social relations making priority to the disease as an avoidance behavior (P= 0.028).



**Table (3): Percentage distribution of patients according to the impact of self-reported cardiac syndromes related- worry on social, psychological and economic status of patients (n = 80).**

Disease impact on social, psychological and economic status of patients.	Age								$\chi^2$ (p <sub>2</sub> )	$\chi^2$ (p <sub>3</sub> )	$\chi^2$ (p <sub>4</sub> )
	<60 (n = 40)				≥60 (n = 40)						
	Male (n = 20)		Female (n = 20)		Male (n = 20)		Female (n = 20)				
No.	%	No.	%	No.	%	No.	%				
Performance of self-care activities:											
Yes	14	70.0	12	60.0	13	65.0	4	20.0	0.114 (0.736)	6.667* (0.010*)	4.073*(0.044*)
No	6	30.0	8	40.0	7	35.0	16	80.0			
$\chi^2$ (p)	0.440 (0.507)				8.286* (0.004*)						
Ability to work:											
Unable	14	70.0	19	95.0	19	95.0	20	100.0	4.329 (**p=0.091)	1.026 (**p=1.000)	5.000 (**p=0.057)
Able	6	30.0	1	5.0	1	5.0	0	0.0			
$\chi^2$ (p)	4.329 (0.091)				1.026 (1.000)						
Psychological acceptance of the disease:											
Yes	12	60.0	18	90.0	9	45.0	15	75.0	0.902 (0.342)	1.558 (**p=0.407)	2.051 (0.152)
No	8	40.0	2	10.0	11	55.0	5	25.0			
$\chi^2$ (p)	4.800* (0.028*)				3.750 (0.053)						
Feeling of sadness and worry not present at past:											
Yes	16	80.0	18	90.0	11	55.0	12	60.0	2.849 (0.091)	4.800* (0.028*)	7.384*(0.007*)
No	4	20.0	2	10.0	9	45.0	8	40.0			
$\chi^2$ (p)	0.784 (**p=0.661)				0.102 (1.000)						
Feeling more burden on others:											
Yes	14	70.0	19	95.0	8	40.0	16	80.0	3.636 (0.057)	2.057 (**p=0.342)	4.943*(0.026*)
No	6	30.0	1	5.0	12	60.0	4	20.0			
$\chi^2$ (p)	4.329 (**p=0.091)				6.667* (0.010*)						
Experience of disability compared to others in the same age group:											
Yes	11	55.0	20	100.0	11	55.0	16	80.0	0.00 (1.000)	4.444 (**p=0.106)	1.003 (0.317)
No	9	45.0	0	0.0	9	45.0	4	20.0			
$\chi^2$ (p)	11.613 (**p=0.001*)				2.849(0.091)						
The preferred hobbies affected with disease:											
Yes	16	80.0	20	100.0	12	60.0	17	85.0	1.905 (0.168)	3.243 (**p=0.231)	4.021*(0.045*)
No	4	20.0	0	0.0	8	40.0	3	15.0			
$\chi^2$ (p)	4.444 (**p=0.106)				3.135 (0.077)						

p<sub>1</sub>: p value for comparing between male and female in each age group

p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group

p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

$\chi^2$ , p:  $\chi^2$  and p values for Chi square test <sup>MC</sup>p: p value for Monte Carlo for Chi square test

<sup>FE</sup>p: p value for Fisher Exact for Chi square test \*: Statistically significant at p ≤ 0.05

**Table (4): Comparison between patients in both groups according to short overall health anxiety levels,** concerning the total score of overall health anxiety, there is a statistical significance difference between the two studied groups (P= 0.038), where the total mean percent score reflecting different level of health anxiety of both males and females <60 years and was more than that of males and females ≥60 years (45.56 ± 19.60, 43.06 ± 15.09) and (41.39 ± 21.36, 28.89 ± 19.78) respectively. Total mean percent score of those <60 was 44.31 ± 17.31 compared with 35.14 ± 21.28 of those ≥60, meant more experience of health anxiety among the younger group.

**Table (4): Comparison between patients in both groups according to short overall health anxiety levels (n=80)**

overall health anxiety level	Age												P <sub>2</sub>	P <sub>3</sub>	Test of sig.(p <sub>4</sub> )
	<60 (n = 40)				Total <60 (n = 40)		≥60 (n = 40)				Total ≥60 (n = 40)				
	Male (n = 20)		Female (n = 20)				Male (n = 20)		Female (n = 20)						
	No.	%	No.	%	No.	%	No.	%	No.	%					
Mild (0 - 26)	11	55.0	10	50.0	21	52.5	14	70.0	15	75.0	29	72.5	MCP=0.608	0.102	χ <sup>2</sup> =3.462 (MCP=0.195)
Moderate (27 - 40)	7	35.0	10	50.0	17	42.5	5	25.0	5	25.0	10	25.0			
Severe (41 - 54)	2	10.0	0	0.0	2	5.0	1	5.0	0	0.0	1	2.5			
χ <sup>2</sup> (MCP)	2.216(0.358)						1.023(1.000)								
<b>Total score</b>	8.0 - 44.0		8.0 - 35.0		8.0 - 44.0		0.0 - 49.0		1.0 - 31.0		0.0 - 49.0		Fp=0.901	Fp=0.097	t=2.113* (0.038*)
Min. - Max.	8.0 - 44.0		8.0 - 35.0		8.0 - 44.0		0.0 - 49.0		1.0 - 31.0		0.0 - 49.0				
Mean ± SD	24.60 ± 10.58		23.25 ± 8.15		23.93 ± 9.35		22.35 ± 11.54		15.60 ± 10.68		18.98 ± 11.49				
<b>% score</b>	14.81 - 81.48		14.81 - 64.81		14.81 - 81.48		0.0 - 90.74		1.85 - 57.41		0.0 - 90.74		Fp=0.901	Fp=0.097	t=2.113* (0.038*)
Min. - Max.	14.81 - 81.48		14.81 - 64.81		14.81 - 81.48		0.0 - 90.74		1.85 - 57.41		0.0 - 90.74				
Mean ± SD	45.56 ± 19.60		43.06 ± 15.09		44.31 ± 17.31		41.39 ± 21.36		28.89 ± 19.78		35.14 ± 21.28				
F <sub>p1</sub>	0.976						0.172								

p<sub>1</sub>: p value for comparing between male and female in each age group

p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group

p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for Chi square test

t, p: t and p values for Student t-test <60 years and >60 years in total

F<sub>p</sub>: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey)

\*: Statistically significant at p ≤ 0.05

**Table (5): Comparison between patients in both groups according to health anxiety factors, the results showed that, there is a statistical significance difference between the two studied groups and between their females regarding illness severity (p= 0.001, 0.004 respectively), where the illness severity is more prevalent in the younger-grouped patients compared with their comparative group and among females <60 years (49.58 ± 18.63) than those ≥60 years (24.58 ± 19.77). Body vigilance was the most contributing factors to health anxiety among the both studied groups (for younger (48.75±24.79); and older (40.21±31.17) group).**

**Table (5): Comparison between patients in both groups according to health anxiety factors (n = 80)**

Health anxiety factors	Age								F <sub>p2</sub>	F <sub>p3</sub>	t(p <sub>4</sub> )
	<60 (n = 40)		Total <60 (n = 40)	Factors' Rank	≥60 (n = 40)		Total ≥60 (n = 40)	Factors' Rank			
	Male (n = 20)	Female (n = 20)			Male (n = 20)	Female (n = 20)					
<b>Illness likelihood</b>	4.0 - 25.0		4.0 - 25.0		0.0 - 25.0		0.0 - 25.0		0.970	0.416	1.373 (0.174)
Total score	5.0 - 17.0				0.0 - 16.0						
Min. - Max.	13.75 ± 6.95		12.73 ± 5.52		12.95 ± 6.13		8.95 ± 5.37				
Mean ± SD	11.70 ± 3.47		10.95 ± 6.03		10.95 ± 6.03		27.38 ± 15.08				
<b>% Score</b>	10.0 - 62.50		10.0 - 62.50	3	0.0 - 62.50		0.0 - 62.50		0.970	0.416	1.373 (0.174)
Min. - Max.	12.50 - 42.50				0.0 - 40.0						
Mean ± SD	34.38 ± 17.38		31.81 ± 13.80		32.38 ± 15.31		22.38 ± 13.41				
t(p <sub>1</sub> )	0.659				0.120						
<b>Body vigilance</b>	0.0 - 10.0		0.0 - 10.0		0.0 - 12.0		0.0 - 12.0		0.999	0.277	1.356 (0.179)
Total score	0.0 - 9.0				0.0 - 9.0						
Min. - Max.	6.10 ± 2.77		5.85 ± 2.97		5.95 ± 3.35		3.70 ± 3.85				
Mean ± SD	5.60 ± 3.22		48.75 ± 24.79		49.58 ± 27.90		40.21 ± 31.17				
<b>% Score</b>	0.0 - 83.33		0.0 - 83.33	1	0.0 - 100.0		0.0 - 100.0		0.999	0.277	1.356 (0.179)
Min. - Max.	0.0 - 75.0				0.0 - 75.0						
Mean ± SD	50.83 ± 23.08		46.67 ± 26.82		30.83 ± 32.12		26.67 ± 22.50				
t(p <sub>1</sub> )	0.964				0.149						
<b>Illness severity</b>	2.0 - 12.0		2.0 - 12.0		0.0 - 12.0		0.0 - 12.0		0.428	0.004*	3.558* (0.001*)
Total score	2.0 - 9.0				0.0 - 9.0						
Min. - Max.	4.75 ± 3.04		5.35 ± 2.70		3.45 ± 3.03		2.95 ± 2.37				
Mean ± SD	16.67 - 100.0		16.67 - 100.0		0.0 - 100.0		0.0 - 100.0				
Min. - Max.	39.58 ± 25.34		44.58 ± 22.53		28.75 ± 25.29		24.58 ± 19.77				
Mean ± SD	16.67 - 100.0		16.67 - 100.0		28.75 ± 25.29		26.67 ± 22.50				
F <sub>p1</sub>	0.499				0.936						

p<sub>1</sub>: p value for comparing between male and female in each age group

p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group

p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

t, p: t and p values for Student t-test

F<sub>p</sub>: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey)

\*: Statistically significant at p ≤ 0.05

**Table (6): Comparison between patients in both groups according to overall illness attitude scale**, the result showed that, there is no statistical significance difference between both studied groups regarding the levels and total mean percent score of illness attitude (P= 0.179, 0.361 respectively). Although not significant, the mean percent scores indicated that below 60 years group presented with more hypochondrial beliefs and attitudes related to acute cardiac episodes ( $45.02 \pm 13.80$ ) than those 60 years and above group ( $42.04 \pm 15.25$ ).

**Table (6): Comparison between patients in both groups according to overall illness attitude scale (n = 80)**

Overall Illness attitude levels	Age												p <sub>2</sub>	p <sub>3</sub>	Test of sig.(p <sub>4</sub> )
	<60 (n = 40)				Total<60 (n = 40)		≥60 (n = 40)				Total ≥60 (n = 40)				
	Male (n = 20)		Female (n = 20)		No.	%	Male (n = 20)		Female (n = 20)		No.	%			
	No.	%	No.	%			No.	%	No.	%					
Mild (0 -46)	8	40.0	8	40.0	16	40.0	9	45.0	13	65.0	22	55.0	0.749	0.113	$\chi^2=1.805$ (0.179)
Moderate (47 -92)	12	60.0	12	60.0	24	60.0	11	55.0	7	35.0	18	45.0			
High (≥93)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0			
$\chi^2$ (MC p <sub>1</sub> )	0.00(1.000)						1.616 (0.204)								
<b>Total score</b>													0.995	0.720	t=0.918 (0.361)
Min. -Max.	20.0 - 81.0		22.0 - 67.0		20.0 - 81.0		15.0 - 89.0		18.0 - 71.0		15.0 - 89.0				
Mean ± SD	49.15 ± 16.22		48.10 ± 13.86		48.63 ± 14.90		47.95 ± 16.97		42.85 ± 15.97		45.40 ± 16.47				
<b>% score</b>													0.997	0.738	
Min. -Max.	18.52 - 75.0		20.37 - 62.04		18.52 - 75.0		13.89 - 82.41		16.67 - 65.74		13.89 - 82.41				
Mean ± SD	45.51 ± 15.02		44.54 ± 12.83		45.02 ± 13.80		44.40 ± 15.71		39.68 ± 14.79		42.04 ± 15.25				
F p <sub>1</sub>	0.997						0.738								

p<sub>1</sub>: p value for comparing between male and female in each age group

p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group

p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

$\chi^2$ , p:  $\chi^2$  and p values for Chi square test

t, p: t and p values for Student t-test for comparing between <60 years and >60 years in total

F, p: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey)

Statistically significant at  $p \leq 0.05$

∗:

**Table (7): Comparison between patients in both groups according to illness attitude scale factors**, the result found that, there is no statistical significance difference between both studied groups concerning general hypochondriacally years and beliefs, symptoms experience and frequency of treatment, thanaphobia, and CHD and associated health habits (P= 0.475, 0.369, 0.255, 0.714 respectively). On the other hand, there is a statistical significance difference regarding coronary heart disease and associated health habits between males and females <60 years ( $p < 0.001$ ), and also between males and females  $\geq 60$  years ( $p < 0.001$ ), where males of both groups experienced avoidance of harmful life style behaviors associated with increased risk of heart disease development or complication, compared to females of both groups. Although not significant, males of both groups exhibited higher mean percent score than females regarding general hypochondriacal fears and beliefs which reflected increased feelings of concern, worry and fear about illness; symptom experience and frequency of treatment which interpreted as both an increased frequency of visits to a variety of health care professionals and that bodily symptoms interfered with normal daily activities, and thanaphobia which demonstrated increased fear of and preoccupation with death. The most contributing factor to illness attitude among the studied groups was CHD and associated health habits (for both younger ( $56.41 \pm 17.13$ ) and older groups ( $57.81 \pm 17.09$ )).

**Table (7): Comparison between patients in both groups according to illness attitude scale factors (n**

Illness attitude factors	Age								p <sub>1</sub>	p <sub>2</sub>	t (p <sub>3</sub> )
	<60 (n = 40)		Total<60	Factors' Rank	≥60 (n = 40)		Total ≥60	Factors' Rank			
	Male (n = 20)	Female (n = 20)			Male (n = 20)	Female (n = 20)					
<b>General hypochondriacally years and beliefs</b>											
<b>Total score</b>											
Min. -Max.	8.0 - 34.0	9.0 - 35.0	8.0 - 35.0		5.0 - 38.0	3.0 - 32.0	3.0 - 38.0				
Mean ± SD	21.45 ± 7.89	19.80 ± 7.83	20.63±7.80		21.55 ± 8.83	16.95 ± 9.32	19.25±9.26				
<b>% score</b>											
Min. -Max.	16.67 - 70.83	18.75 - 72.92	16.67 - 72.92		10.42 - 79.17	6.25 - 66.67	6.25 - 79.17				
Mean ± SD	44.69 ± 16.44	41.25 ± 16.31	42.97±16.26	3	44.90 ± 18.39	35.31 ± 19.42	40.10±19.29	3	1.000	0.714	0.718 (0.475)
<b>F<sub>p1</sub></b>	0.927				0.324						
<b>Symptoms experience and frequency of treatment</b>											
<b>Total score</b>											
Min. -Max.	3.0 - 22.0	3.0 - 22.0	3.0 - 22.0		3.0 - 28.0	3.0 - 20.0	3.0 - 28.0				
Mean ± SD	12.25 ± 5.47	14.40 ± 4.97	13.33±5.27		11.65 ± 5.98	12.90 ± 4.18	12.28±5.13				
<b>% score</b>											
Min. -Max.	10.71 - 78.57	10.71 - 78.57	10.71 - 78.57		10.71 - 100.0	10.71 - 71.43	10.71 - 100.0				
Mean ± SD	43.75 ± 19.52	51.43 ± 17.74	47.59±18.82	2	41.61 ± 21.34	46.07 ± 14.92	43.84±18.32	2	0.983	0.797	0.903 (0.369)
<b>F<sub>p1</sub></b>	0.559				0.871						
<b>Thana phobia</b>											
<b>Total score</b>											
Min. -Max.	0.0 - 12.0	0.0 - 14.0	0.0 - 14.0		0.0 - 12.0	0.0 - 11.0	0.0 - 12.0				
Mean ± SD	4.70 ± 3.89	6.60 ± 4.68	5.65±4.36		3.90 ± 3.18	5.35 ± 3.92	4.63±3.60				
<b>% score</b>											
Min. -Max.	0.0 - 75.0	0.0 - 87.50	0.0 - 87.50		0.0 - 75.0	0.0 - 68.75	0.0 - 75.0				
Mean ± SD	29.38 ± 24.34	41.25 ± 29.27	35.31±27.24	4	24.37 ± 19.86	33.44 ± 24.52	28.91±22.50	4	0.919	0.750	1.147 (0.255)
<b>F<sub>p1</sub></b>	0.431				0.654						
<b>CHD and associated health habits</b>											
<b>Total score</b>											
Min. -Max.	6.0 - 15.0	5.0 - 11.0	5.0 - 15.0		4.0 - 14.0	3.0 - 10.0	3.0 - 14.0				
Mean ± SD	10.75 ± 2.40	7.30 ± 1.84	9.03±2.74		10.85 ± 2.66	7.65 ± 1.69	9.25±2.73				
<b>% score</b>											
Min. -Max.	37.50 - 93.75	31.25 - 68.75	31.25 - 93.75		25.0 - 87.50	18.75 - 62.50	18.75 - 87.50				
Mean ± SD	67.19 ± 15.02	45.62 ± 11.49	56.41±17.13	1	67.81 ± 16.63	47.81 ± 10.59	57.81±17.09	1	0.999	0.957	0.368 (0.714)
<b>F<sub>p1</sub></b>	<.0001*				<.0001*						

p<sub>1</sub>: p value for comparing between male and female in each age group p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for Chi square test t, p: t and p values for Student t-test

F,p: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey) \*: Statistically significant at p ≤ 0.05

**Table (8): Comparison between patients in both groups according to overall anxiety control levels,** the result presented that, there is no statistical significance difference between both studied groups in general regarding the levels and total score of anxiety control (p= 0.056, 0.091 respectively). However, a statistical significance difference regarding levels of anxiety control between males in both groups were prevailed (p =0.011). Male older adults exhibit higher level of anxiety control compared with their counterpart group. Nevertheless, it was found that, there is a statistical significance difference regarding levels of anxiety control between males and females ≥60 years (P =0.004), where less than two third 65% of male patients had moderate level of anxiety control and more than one half of female patients 57.5% had low level of anxiety control. In conclusion and although not significant, the table represented that older adults used more anxiety-control measures than younger adults did.

**Table (8): Comparison between patients in both groups according to overall anxiety control levels (n = 80)**

Overall Anxiety control levels	Age										p <sub>2</sub>	p <sub>3</sub>	Test of sig.(p <sub>4</sub> )		
	<60 (n = 40)				Total<60 (n = 40)		≥60 (n = 40)							Total ≥60 (n = 40)	
	Male (n = 20)		Female (n = 20)		No.	%	Male (n = 20)		Female (n = 20)					No.	%
	No.	%	No.	%			No.	%	No.	%					
<b>Anxiety control</b>															
Very low (0 - <25)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.011*	F <sub>p</sub> =1.000	χ <sup>2</sup> = 3.647 (0.056)
Low (25 - <75)	15	75.0	16	80.0	31	77.5	7	35.0	16	80.0	23	57.5			
Moderate (75-<125)	5	25.0	4	20.0	9	22.5	13	65.0	4	20.0	17	42.5			
High (≥125)	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0			
χ <sup>2</sup> (p <sub>1</sub> )	0.143 (F <sub>p</sub> =1.000)						8.286*(0.004*)								
<b>Total score</b>															
Min. - Max.	40.0-119.0		31.0-92.0		31.0-119.0		34.0-109.0		42.0-101.0		34.0-109.0		0.685	0.472	t=1.709 (0.091)
Mean ± SD	68.70±20.67		52.55±19.62		60.62±21.5		75.70±21.76		61.70±17.50		68.7±20.74				
<b>% score</b>															
Min. - Max.	26.67-79.33		20.67-61.33		20.67-79.33		22.67-72.67		28.0-67.33		22.67-72.67				
Mean ± SD	45.80±13.78		35.03±13.08		40.42±14.3		50.47±14.50		41.13±11.67		45.80±13.8				
F <sub>p1</sub>	0.059						0.127								

p<sub>1</sub>: p value for comparing between male and female in each age group      p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group      p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for Chi square test      t, p: t and p values for Student t-test for comparing between <60 years and >60 years in total

F, p: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey)      \*: Statistically significant at p ≤ 0.05

**Table (9): Comparison between patients in both groups according to anxiety control factors**, the results showed that, there is no statistical significance difference between the two studied groups concerning external lack of control, internal control and internal lack of control (p= 0.398, 0.224, and 0.126 respectively). Although the parameters didn't show any significance, male and female older adults demonstrated higher mean percent scores than their male and female younger adults in the three previous domains of anxiety control. In relation to effective coping, there is a statistical significance difference between the two studied groups (P= 0.013). While, there is an observed statistical significance difference between males and females <60 years regarding internal anxiety control (p= 0.046), where males show more internal anxiety control than females (53.13 ± 20.28) and (35.13 ± 21.88) respectively. The most contributing factor to anxiety control among the studied groups was effective coping among younger (45.80±17.02) and older group (55.50±17.26).

Table (9): Comparison between patients in both groups according to anxiety control factors (n = 80)

Anxiety control factors	Age								p <sub>1</sub>	p <sub>2</sub>	t (p <sub>1</sub> )
	<60 (n=40)		Total <60	Factors' Rank	≥60 (n=40)		Total ≥60	Factors' Rank			
	Male (n=20)	Female (n=20)			Male (n=20)	Female (n=20)					
<b>External lack of control</b>											
Total score											
Min. - Max.	11.0 - 38.0	12.0 - 33.0	11.0 - 38.0		11.0 - 31.0	12.0 - 23.0	11.0 - 31.0				
Mean ±SD	19.40 ± 7.60	17.0 ± 4.90	18.20 ± 6.43		20.0 ± 5.08	18.45 ± 2.72	19.23 ± 4.10				
% score											
Min. - Max.	22.0 - 76.0	24.0 - 66.0	22.0 - 76.0		22.0 - 62.0	24.0 - 46.0	22.0 - 62.0				
Mean ±SD	38.80 ± 15.20	34.0 ± 9.80	36.40 ± 12.85	4	40.0 ± 10.16	36.90 ± 5.45	38.45 ± 8.20	4	0.985	0.828	0.851 (0.398)
p <sub>3</sub>	0.494				0.797						
<b>Internal control</b>											
Total score											
Min. - Max.	4.0 - 37.0	5.0 - 32.0	4.0 - 37.0		7.0 - 36.0	8.0 - 32.0	7.0 - 36.0				
Mean ±SD	21.25 ± 8.11	14.05 ± 8.75	17.65 ± 9.09		23.30 ± 9.27	17.0 ± 8.05	20.15 ± 9.14				
% score											
Min. - Max.	10.0 - 92.50	12.50 - 80.0	10.0 - 92.50		17.50 - 90.0	20.0 - 80.0	17.50 - 90.0				
Mean ±SD	53.13 ± 20.28	35.13 ± 21.88	44.13 ± 22.73	2	58.25 ± 23.17	42.50 ± 20.11	50.38 ± 22.85	2	0.873	0.697	1.226 (0.224)
p <sub>3</sub>	0.046				0.101						
<b>Internal lack of control</b>											
Total score											
Min. - Max.	6.0 - 28.0	3.0 - 22.0	3.0 - 28.0		6.0 - 24.0	7.0 - 27.0	6.0 - 27.0				
Mean ±SD	15.60 ± 5.14	11.05 ± 5.98	13.33 ± 5.97		17.50 ± 6.27	13.40 ± 5.82	15.45 ± 6.32				
% score											
Min. - Max.	17.14 - 80.0	8.57 - 62.86	8.57 - 80.0		17.14 - 68.57	20.0 - 77.14	17.14 - 77.14				
Mean ±SD	44.57 ± 14.70	31.57 ± 17.08	38.07 ± 17.05	3	50.0 ± 17.91	38.29 ± 16.82	44.14 ± 18.06	3	0.731	0.580	1.546 (0.126)
p <sub>3</sub>	0.072				0.125						
<b>Effective coping</b>											
Total score											
Min. - Max.	8.0 - 22.0	5.0 - 19.0	5.0 - 22.0		7.0 - 22.0	8.0 - 22.0	7.0 - 22.0				
Mean ±SD	12.45 ± 3.66	10.45 ± 4.65	11.45 ± 4.25		14.90 ± 4.10	12.85 ± 4.38	13.88 ± 4.32				
% score											
Min. - Max.	32.0 - 88.0	20.0 - 76.0	20.0 - 88.0		28.0 - 88.0	32.0 - 88.0	28.0 - 88.0				
Mean ±SD	49.80 ± 14.65	41.80 ± 18.60	45.80 ± 17.02	1	59.60 ± 16.41	51.40 ± 17.52	55.50 ± 17.26	1	0.264	0.281	2.531* (0.013*)
p <sub>3</sub>	0.442				0.420						

p<sub>1</sub>: p value for comparing between male and female in each age group      p<sub>2</sub>: p value for comparing between <60 years and >60 years in male group

p<sub>3</sub>: p value for comparing between <60 years and >60 years in female group      p<sub>4</sub>: p value for comparing between <60 years and >60 years in total

χ<sup>2</sup>, p: χ<sup>2</sup> and p values for Chi square test      t, p: t and p values for Student t-test

F, p: F and p values for ANOVA test, Sig. bet. groups was done using Post Hoc Test (Tukey)

Statistically significant at p ≤ 0.05

**Table (10): The relation between anxiety control, health anxiety and illness attitude of patients in both groups,** in relation to male patients <60 years, there is a statistical significance difference between anxiety control and patients' level of health anxiety from side (p= 0.003) and their illness attitude from the other side (p= 0.016), where, as the level of anxiety control decreased, the mean score of the health anxiety and illness attitude increased and vice versa. The same picture was observed regarding female patients <60 years. There is a highly statistical significance difference and inverse relation between level of anxiety control and health anxiety based on both short health anxiety inventory (SHAI) and illness attitude scale (IAS) (p<0.001 in both). Concerning female patients ≥60 years, there is also a statistical significance difference between anxiety control and health anxiety based on both (SHAI) and (IAS) (p=0.001, and 0.003 respectively).

**Table (10): The relation between anxiety control, health anxiety and illness attitude of patients in both studied groups (n=80)**

Anxiety control	N	Health anxiety (SHAI)		t	P	Health anxiety (IAS)		t	p
		Min. - Max.	Mean ± SD.			Min. - Max.	Mean ± SD.		
<b>Male (&lt;60)</b>									
Very low (0 - <25)	0	-	-			-	-		
Low (25 - <75)	15	20.37 - 81.48	52.47 ± 17.20	3.413*	0.003*	21.30 - 75.0	50.0 ± 13.80	2.660*	0.016*
Moderate (75-<125)	5	14.81 - 33.33	24.81 ± 8.55			18.52 - 43.52	32.04 ± 10.11		
High (≥125)	0	-	-			-	-		
<b>Female (&lt;60)</b>									
Very low (0 - <25)	0	-	-			-	-		
Low (25 - <75)	16	37.04 - 64.81	49.65 ± 7.48	8.612*	<0.001*	29.63 - 62.04	49.13 ± 9.30	4.598*	<0.001*
Moderate (75-<125)	4	14.81 - 18.52	16.67 ± 1.51			20.37 - 36.11	26.16 ± 6.86		
High (≥125)	0	-	-			-	-		
<b>Male (≥60)</b>									
Very low (0 - <25)	0	-	-			-	-		
Low (25 - <75)	7	5.56 - 90.74	43.92 ± 25.72	0.379	0.709	13.89 - 82.41	46.16 ± 20.27	0.360	0.723
Moderate (75-<125)	13	0.0 - 74.07	40.03 ± 19.65			20.37 - 62.04	43.45 ± 13.51		
High (≥125)	0	-	-			-	-		
<b>Female (≥60)</b>									
Very low (0 - <25)	0	-	-			-	-		
Low (25 - <75)	16	9.26 - 57.41	34.49 ± 17.75	4.670*	0.001*	30.56 - 65.74	44.21 ± 12.43	3.439*	0.003*
Moderate (75-<125)	4	1.85 - 18.52	6.48 ± 8.07			16.67 - 33.33	21.53 ± 7.91		
High (≥125)	0	-	-			-	-		

\*: Statistically significant at  $p \leq 0.05$ t, p: t and p values for **Student t-test**

#### IV. Discussion

Health anxiety, with its pathological synonym term, hypochondriasis (HC), is a widely observed problem yet still undiagnosed and ignored common psychiatric health issue among both younger and older adults in clinical settings especially regarding acute cases in the cardiology hospital medical inpatient departments<sup>(38)</sup>. Our justification is that patients once labeled with medical illnesses, any level of health anxiety is seen proportionate and reasonable. In addition, several confusing manifestations are in common between anxiety and cardiac illnesses as palpitation, tachypnea and sweating; making differentiation between both a difficult issue especially in older adults who commonly presenting with atypical non- classical symptoms. Latest form of reaction can be seen in older adults compared to younger ones, relating the disease to be a consequence of age-related changes in cardiovascular system, requesting no treatment because nothing will be changed; this stereotyped thinking making identification of health anxiety in older patients more challenging<sup>(39)</sup>.

The prevalence of HA varied across the literature. In the current study, 52.2% of younger adults represented with mild degree of anxiety feelings about health compared to 72.5% of those older. Because the assumption that most of us experience health - focused worries and thoughts from time to time as our physical health is the most important area of life, it is expected that mild and normative level of health-related anxiety is present to some extent in medically ill individuals or those suffering from serious and threatening illness to act as an adaptive and motivator mechanism to deal professionally and in a timely-fashion with serious manifestations. Taylor and Asmundson (2004)<sup>(40)</sup> concluded that people's adaptive concerns about their health lasted usually in a short-term period and considered acceptable as long as they initiate people to engage in proper action or seek needed medical attention and neither replaced by increased attentional focus on internal sensations nor dispelled through unneeded medical consultation. As a consequence, more attention should be paid to the mild form of health anxiety because it often progress to uncontrollable form in vulnerable individuals if not properly investigated and managed. The problem arises if health- anxious individuals intensely and catastrophically become overestimated by the probability that medical conditions become serious and dealt less which give rise to preoccupation with health-related dysfunctional beliefs, the suspected illness and selectively pay attention to illness-related stimulus. In the present study, 42.5% of younger adults in comparison with 25% of older ones had moderate levels of HA. Using illness attitude scale, 60% of those <60 years and 45% of those ≥60 years of the total sample reported moderate fears, attitudes, beliefs, behaviors, HA, and effects related to hypochondriasis relevant to the acute cardiac episodes. Whereas, severe health anxiety level constituted 5% and 2.5% of the previous studied groups respectively on SHAI.

The American Psychiatric Association [APA] (2000),<sup>(5)</sup> confirmed our results and revealed that the lifetime prevalence rate of clinical forms of HA ranged from 1-5%. An Egyptian study (1995)<sup>(16)</sup> to investigate the prevalence of hypochondriacal fears, believes, and attitudes of 60 art and medical students at Zagazig University; revealed that the prevalence of hypochondriasis among the above mentioned students was 25% and 26.7% respectively on Whitely Index and 43% and 40% respectively on Illness Attitude Scale.

Despite the common notion that older adults have more health problems, experiencing more psychosocial deviations and loss of control and independence which subsequently elevate the probability of exaggerated health concerns and health-related anxiety<sup>(14,12)</sup>, studied older adults in the current study

demonstrated lower levels of health anxiety in comparison with the studied younger adults. According to SHAI, total mean percent score of those <60 was  $44.31 \pm 17.31$  compared with  $35.14 \pm 21.28$  of those  $\geq 60$ . This finding is supported by Stone et al., (2010)<sup>(41)</sup> who showed that older individuals have a decreased risk of suffering from mental health issues, including anxiety compared to middle-aged adults. In another study, Bourgault-Fagnou and Hadjistavropoulos (2009)<sup>(42)</sup> found that high-frailty older adults had the highest levels of health anxiety when compared to low frailty older adults and young adults. Further, they declared that high-frailty elders scored similarly to young adults on a measure of health anxiety after controlling the health problems. Moreover, the findings of Gerolimos (2012)<sup>(43)</sup> supported current research results. Different result was exhibited in New Zealand study (2010)<sup>(44)</sup> which revealed that incidence of health anxiety in older individuals was parallel to that found in younger individuals. Other researches showed that health anxiety increases with age<sup>(45, 46)</sup>

In the current research, age differences in health anxiety may be explained by older adults' past experiences with health problems. That is, older adults likely have had more experience with health problems during which they established talents to deal with such problems. For example, their prospects may be more realistic and may be less anxiety-provoking, they may display coping schemes more effectively, or they may select to use coping plans that are better suited to coping with health concerns. Further age differences in anxiety may be the result of physiological and psychosocial events which the life of older adults full of; including significant losses, lack of social support, fearing of debilitating disease state, stressors, negative life experiences, disabilities, increasing frailty, sensory-perceptual disorders, falls and loss of independence and control for which no adequate resources available to cope with and which reactivate the likelihood of exaggerated health concerns<sup>(43)</sup>.

Beside the above mentioned significant age differences, the current study also, elicited a statistical significance difference between gender and level of health anxiety, where older females had higher health anxiety level than older males. This finding is in accordance with Monopoli (2005)<sup>(47)</sup> who concluded that research as a whole seems to indicate that an older adult who is low in hypochondriasis may also be male in some societies. Of note is that females developed cardiac diseases in an age older than males, have more burdened comorbidities and functional impairment, and tend to live alone than did older males. Thus the compromised physical aspects and lack of support would be associated with severe health anxiety. Non-cardiac chest pain is more prevalent in females in comparing with males and maybe attributed to more anxiety which confirmed in the work of Seedat and colleagues (2009)<sup>(48)</sup>.

Based on participants' responses to the illness attitude scale (IAS), the present study concluded that those who are less than 60 years presented with more anxiety related to acute cardiac episodes ( $45.02 \pm 13.80$ ) than those who have 60 years and above ( $42.04 \pm 15.25$ ) that validate the current study health anxiety results based on SHAI which is unique finding of this study but no age & gender statistical significance differences between both studied groups based on IAS.

Of particular interest, our study is from the scarce that investigate the relation between health anxiety and perceived anxiety control in both younger and older adults. In this regard, the current study portrayed a statistical significance difference between age and levels of perceived anxiety control ( $p = 0.011$ ). Male older adults exhibit higher level of anxiety control compared with male young adults, which stand in line with results from Gerolimos (2012)<sup>(43)</sup> and supported by literature signifying better controlling processes in late life<sup>(49)</sup>. In contrary, Gould & Edelstein (2010)<sup>(29)</sup> did not discover any significant differences in perceived anxiety control between young and older adults groups.

On the other hand, it was found that, there is a statistical significance difference between gender and levels of anxiety control for older group ( $p = 0.004$ ), where older male patients had higher level of anxiety control than older female patients. This finding stand in contrast with Gould and Edelstein (2010)<sup>(29)</sup> who detected no gender differences regarding levels of anxiety control for older participants. This difference can be explained by the Egyptian society's customs or ways of nurturing in which men must have higher control over their anxieties and being less likely to report negative feelings. Disclosing inability to control over situations is considered improper weakness and threatens males' guardianship.

Concerning the relation between anxiety control and health anxiety, the current study determined that a higher level of perceived anxiety control was associated with lower level of health anxiety based on both SHAI and illness attitude scale which is incomparable result. Age and sex significant differences regarding perceived control and health anxiety between participants in both groups were also detected. In this track, Gould and Edelstein (2010)<sup>(29)</sup> demonstrated that greater anxiety control was associated with less reported worry among older and younger adults. Hunt and colleagues (2003)<sup>(50)</sup> found that while young adults worried more frequently than older adults, young adults utilized more strategies to cope with their worries. Both emotion regulation and anxiety control can be abstracted as coping aspects and may lessen suffering associated with particular components of health anxiety.



Even though, safety-seeking behaviors (i.e., maladaptive coping behaviors) including reassurance seeking, avoidance and recurrent checking behaviors can provide transient relief from health-related distress, also they propagate dysfunctional beliefs, associated distress and functional limitations<sup>(29)</sup>. In this regard, the majority of study subjects in the present research self-reported use of at least one health seeking behavior to cope with their health-related worry such as multiple checking and doctor visit. Reassurance seeking, repeated requests for investigations, continuous/repeated self-exam and avoidance behaviors such as restrict social relations and avoid any situation can exacerbate symptoms of the disease. This stands in line with the findings of Boston (2008)<sup>(51)</sup>. Also, a significant age and sex differences were found between participants in both groups in relation to repeated requests for laboratory investigations and continuous self-exam ( $p= 0.044, 0.007, 0.026, 0.045, 0.026, 0.024$  respectively); in addition to restriction of social relations making priority to the disease as an avoidance behavior ( $p= 0.028$ ). The dangerous of adopting these behaviors included in the maintenance of anxiety because they inhibit disprove of the feared catastrophe which subsequently leads to recurrent efforts to attain reassurances from family and a variety of medical experts. This conduct sustains and raises attention to and negative thoughts about disease and illness<sup>(51, 52)</sup>. Consistent with the cognitive behavioral model, health anxiety was a unique significant predictor of safety behaviors. Health anxiety and decreased physical function predicted medical utilization<sup>(44,53)</sup>.

## V. Conclusion

Studied older adults in the current study demonstrated lower levels of health anxiety in comparison with the studied younger adults according to SHAI. The same finding was confirmed using Illness Attitude Scale. Moreover, the current study determined that a higher level of perceived anxiety control was associated with lower level of health anxiety based on both SHAI and illness attitude scale which is incomparable results to this study. Age and sex significant differences regarding perceived control and health anxiety between participants in both groups were also detected.

## VI. Recommendations

- 1- Health anxiety screening should be established as a routine screening measure for both younger and older adult's patients in clinical settings to differentiate between hypochondriacal symptoms and real health problems in order to deliver appropriate treatments.
- 2- Level of anxiety control, age and gender differences must be considered when planning health anxiety interventions.
- 3- The hospitals management should institute an improved supported level of care to meet the required medical & psychological needs of patients, to build the patient's sense of control, such as involving the patient in treatment planning.
- 4- Developing and implementing in-service training programs for nurses to educate them about assessment of health anxiety, early identify of maladaptive coping behaviors and appropriate nursing interventions to offset unneeded healthcare costs.

### Recommendation for future studies

1. Encourage future larger community-based studies on health anxiety considering age and gender differences and its management.
2. Because anxiety over health-related matters is a feature of other several anxiety disorders especially panic disorder and anxiety sensitivity, researches differentiating health anxiety from other anxiety disorders are needed.
3. More researches on developing a consensus measure for assessing HC and HA in older adults is needed as studied these topic hampered by the lack of such measures because of the absence of diagnostic criterion specific to this age-group.

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