

**Faculté de psychologie et des sciences
de l'éducation**

Denial in coronary disease

**A way to protect oneself as well as the significant
other ?**

**Auteur : Emilie Banse
Promoteur(s) : Maximilien Gourdin & Pascal Janne
Année académique 2020-2021
Master de Psychologie de la Santé**



Faculté de Psychologie et des Sciences de l'Éducation

Denial in coronary disease: a way to protect oneself as
well as the significant other ?

Promoteur: Pr. Gourdin Maximilien

Co-promoteur: Pr. Janne Pascal

Mémoire présenté en vue de
l'obtention du grade de Master en
Sciences Psychologiques

Par Emilie Banse

Louvain-La-Neuve, 2021

Acknowledgments

This master's thesis marks the end of five years of study that have been incredibly enriching for me. First of all, I would like to thank all persons that have contributed to the achievement of my studies and to the completion of this thesis.

I would like to thank Professor M. Gourdin, promoter of this thesis, for his interest in my work and to have always assured me of his availability from start to finish. I also wish to thank Professor P. Janne in particular, co-promoter of this thesis, for believing in me throughout my work, but also for putting me on the right track when needed to. His encouragements and reinsurance, our numerous exchanges, at distance or in his office, were of great help to me.

I also wish to thank all the other persons who have given their agreement and helped me to collect data in the CHU Namur – Godinne site. Thank you to A. Guedes (head of the cardiology department), L. Gabriel (chief of the clinic of cardiology), L. Thavier (nurse head of the cardiology department), but also all the nurses, physiotherapists and secretaries who have agreed to help me by distributing my survey among patients suffering from coronary heart diseases. A special thank you to V. Laloux (psychologist of the cardiology department) for her warm welcome and constant help throughout my internship, which I have truly loved. Without all of those persons, I would not have been able to collect the relevant data to conduct the study of this thesis. My gratitude also goes, of course, to all the patients, hospitalized or not, who have agreed to participate to this study.

Finally, I would like to address my thanks to my family and friends. Dad, thank you for your help by rereading and commenting my work. Mom, Maxime, Valentine and Mathilde, thank you for having helped me by encouraging me and supporting me in the achievement of my thesis. I would not have been able to do this without all of you.

« I declare on my honor that this thesis was written by me, without having solicited any illicit external aid, that it is not a reworking of work submitted to another institution for evaluation, and that it has never been published, in whole or in part. All information (ideas, sentences, graphs, maps, tables,...) borrowed or referring to primary or secondary sources are properly referenced according to the academic method in force. I declare that I have read and adhere to the Code of Ethics for Students on borrowing, quoting and exploiting various sources and that I am aware that plagiarism is a serious offence punishable by the Université Catholique of Louvain. »

Table of contents

Introduction.....	1
THEORETICAL SECTION.....	3
<i>Introduction to the theoretical section.....</i>	<i>3</i>
<i>Chapter 1. Coronary heart diseases.....</i>	<i>3</i>
1. Introduction.....	3
2. Coronary heart diseases	4
1. General anatomy and functioning of the heart.....	4
2. Pathophysiology and clinical presentation of coronary heart diseases....	5
3. Risk factors of coronary heart diseases.....	7
3. Main diagnostic tests and medical procedures	7
1. Coronarography	8
2. Percutaneous Coronary Intervention [PCI].....	8
3. Coronary artery bypass grafting [CABG].....	9
4. Consequences of the disease.....	9
1. Living with a CHD	9
2. Life after a myocardial infarction	10
5. Conclusion	10
<i>Chapter 2 : The phenomenon of denial</i>	<i>11</i>
1. Introduction.....	11
2. Denial as a defense mechanism	12
1. What are defense mechanisms ?	12
2. A definition of denial.....	13
3. Denial according to different theoretical frameworks	15
4. A precision of terms.....	15
5. Conclusion	17
<i>Chapter 3 : Denial as a means of coping with coronary heart diseases.....</i>	<i>17</i>
1. Introduction.....	17
2. Selection of the relevant articles	18
3. A psychosomatic approach	18
4. The behavior of a denying patient	19

5.	Assessment and significance of denial in coronary diseases.....	20
6.	Consequences of denial	22
1.	On mental health.....	22
2.	On physical health	23
3.	Time-differential effects	25
7.	Conclusion	25
	<i>Chapter 4 : Why do some patients deny more than others ?</i>	<i>26</i>
1.	Introduction.....	26
2.	Characteristics of the denying patient.....	27
3.	Functions of denial	28
4.	Myocardial infarction: an acute event	29
5.	An interpersonal perspective	30
6.	Conclusion	32
	<i>Conclusion to the theoretical section.....</i>	<i>33</i>
	EMPIRICAL SECTION	36
	<i>Introduction to the empirical section.....</i>	<i>36</i>
	<i>Chapter 1 : Methodology, instrument and sampling</i>	<i>36</i>
1.	Procedure	36
2.	Description of the sample	37
3.	Research instrument.....	38
1.	Introduction.....	38
2.	Sociodemographic information.....	38
3.	Measure of denial.....	39
4.	Measure of presence and perceived anxiety of the significant other	40
4.	Hypotheses.....	41
1.	Characteristics of deniers.....	41
2.	Hypotheses regarding determinants of denial.....	43
3.	Exploratory hypothesis regarding the subscales of IDQ	44
	<i>Chapter 2 : Analysis of the results.....</i>	<i>44</i>
1.	Introduction.....	44
2.	Sociodemographic hypotheses.....	44
3.	Hypotheses regarding determinants of denial.....	48

4. Exploratory hypothesis regarding the subscales of IDQ	49
<i>Chapter 3 : Discussion of the results</i>	50
1. Introduction.....	50
2. Interpretation and discussion of the results.....	50
3. A proposition of case study	58
4. Limitations	58
5. Perspectives	60
GENERAL CONCLUSION	61
Bibliography	64
Appendix	78
1. <i>Survey of the study</i>	78
2. <i>Descriptive statistics</i>	82
3. <i>Inferential statistics and data analysis</i>	88
4. <i>Raw data processing</i>	92
5. <i>A case study</i>	93
6. <i>Agreement of the Ethics Committee</i>	95
Abstract	97

Introduction

According to the World Health Organization [WHO] (2017), it is estimated that cardiovascular diseases [CVDs] are the number one cause of death globally. Each year, CVDs take an estimated 17.9 million lives. Of these deaths, 85% are due to heart attack and stroke. The most frequent form of CVDs consists of coronary heart disease, a disease of the blood vessels that supply our heart.

Living with a heart disease may cause fear, anxiety, depression and stress (National Heart, Lung and Blood Institute [NHLBI], n.d.-a). For example, anxiety is highly prevalent among patients with a cardiovascular disease (Celano, Daunis, Lokko, Campbell & Huffman, 2016). Patients suffering from a coronary heart disease might use several strategies to cope with their illness and its psychological as well as physical consequences. An often studied psychological mechanism used among patients suffering from a coronary heart disease is denial (Jadoulle, 2006; Sirois, 1992).

Denial is a psychological mechanism that individuals employ in an unconscious way when confronted to an unacceptable, threatening and potentially harmful condition, by not accepting to perceive or consciously acknowledge the impact of a possible threat (Fang et al., 2016; Marcus, 1999). Many studies have examined the short- and long-term effects of denial on both the physical and mental health of patients suffering from coronary heart diseases. For example, in a study conducted by Fang and colleagues in 2016 among patients suffering from myocardial infarction, evidence has been provided for the short-term benefits but long-term detrimental effects of denial. According to these authors and in their study, up to 42.0% of the patients were identified as deniers. As it seems, denial leads in a first stage to diminishing acute heart related symptoms as well as negative affectivity. But patients that deny are more likely to delay seeking medical help and to comply less to their medical treatments (Levine et al., 1987).

As many studies have investigated consequences of the use of denial, less studies have focused on the characteristics of patients suffering from coronary heart diseases who deny. An important question to investigate is *why* some patients make a greater use of denial than others. What are factors that could determine a greater use of denial ?

This thesis aims at responding at this question by investigating variables who could influence the use of denial. Next to the investigation of sociodemographic variables, two main factors will be assessed. We first want to investigate if the use of denial is greater among patients having specifically suffered from a myocardial infarction, as it is an emotionally charged event eliciting intense distress, including the fear of dying. Second, we also want to see if the use of denial is greater among patients who are accompanied on a daily basis by a significant other, may it be a life companion, or any other person that is frequently there to help facing the coronary heart disease. It is possible that the patient who uses denial might also want to use it to protect that significant other, often perceived as anxious by the patient himself. Denial would then be used to preserve important interpersonal relationships (Goldbeck, 1997).

We hope to clarify the function of denial among patients suffering from coronary heart diseases. To do so, our research will be composed of two stages. First, we will present a theoretical part helping us to shed a light on the knowledge regarding the subject of denial in coronary heart diseases. This part will include concrete notions to better understand what is coronary heart disease, and what is denial. Then, in the empirical section, we will conduct a study investigating our two main research questions and hypotheses. Results will be discussed and interpreted.

THEORETICAL SECTION

Introduction to the theoretical section

This first section consists of a literature review of the current knowledge regarding denial in coronary heart diseases. The first chapter will focus on coronary heart diseases and wants to give general information about the anatomy of the heart, but more precisely about coronary heart diseases, its causes, consequences and possibilities of treatment. The second chapter considers the phenomenon of denial and what we now know about it. A global picture of literature considering denial as a defense mechanism will be given. Some important precisions that need to be made when one talks about denial will be proposed. The third chapter will focus on the use of denial by patients as a coping mechanism to deal with coronary heart diseases, according to a psychosomatic approach. We will give further development of the behaviors that can be observed among denying patients, and the consequences of the use of denial on both physical and mental health, at short and long term. Information will also be given on the assessment and prevalence of denial. In the fourth chapter, our aim is to focus on reasons and possible determinant factors of a greater use of denial when suffering from a coronary heart disease. More specifically, we propose to concentrate on two main elements: having suffered from a myocardial infarction, and adopting an interpersonal perspective where the patient's significant other is taken into account. The conclusion of this chapter will introduce to the relevance of our current study that focuses on factors that could influence the presence of denial among patients suffering from coronary heart diseases.

Chapter 1. Coronary heart diseases

1. Introduction

WHO estimates that cardiovascular diseases [CVDs] are the number one cause of death globally. This means that, every year, more people die from CVDs than from any other cause (WHO, 2017). Today cardiovascular diseases form the greatest scourge affecting industrialized nations. Costs resulting from CVDs include human suffering as well as material resources (Zipes et al., 2019). Cardiovascular diseases are

a class of diseases including diseases of the heart, vascular diseases of the brain and diseases of blood vessels (Mendis et al., 2011). Most CVDs are due to atherosclerosis, the accumulation of plaques in the arteries. Those plaques include fat, cholesterol, calcium, and other substances found in the blood. The most frequent form of CVD is coronary heart disease. In coronary heart disease [CHD], also called coronary artery disease [CAD] or ischemic heart disease [IHD], the accumulation of plaques due to atherosclerosis results in a reduction of blood flow to the muscle of the heart (NHLBI, n.d.-a). This can lead to serious consequences.

This chapter will include information about the heart and the way it functions as one of our most important organs, an introduction to what coronary heart diseases are, the symptoms it causes, the current knowledge about the origins of coronary heart diseases, possible treatments that exist to face this disease as well as consequences of suffering from coronary heart diseases.

2. Coronary heart diseases

1. General anatomy and functioning of the heart

The essential role of our cardiovascular system is to transport chemical energy throughout our body so that it can function correctly (Tajeddine, 2016), as well as draining the heart. Our cardiovascular or circulatory system is made by a series of successive elements: the heart (a muscle), blood vessels, lymphatic nodes and vessels (Lengelé & Behets Wydemans, 2020). The heart is a muscular organ that pumps blood through the vessels of our circulatory system (Venes, Biderman & Fenton, 2009). As told by Weinhaus & Roberts (2009), the human heart is located in the thorax or thoracic cage, which has a protective function. Our heart is composed of four chambers of cardiac muscle (myocardium), able to contract. The upper chambers, or atria, are collecting chambers. The two lower chambers, or ventricles, function to pump blood. The right atrium and ventricle collect blood from the body that is pumped to the lungs. The left atrium and ventricle collect blood from the lungs (charged with oxygen) and pump it throughout the body. Our cardiovascular system is made in such a way that blood only circulates in one way through the heart. This is made possible by a set of

four valves (Weinhaus & Roberts, 2009). The heart pumps blood through the vascular network composed of arteries, veins and lymphatic vessels and nodes (Lengelé & Behets Wydemans, 2020).

To be nourished, the tissues of the heart are supplied by a separate vascular supply, the left and right coronary arteries (Weinhaus & Roberts, 2009). This arterial supply diffuses nutrients and oxygen necessary to the good functioning of the heart and gives the necessary energy for the heart to contract itself. This arterial supply is provided by coronary arteries and veins. Coronary arteries emerge from the aorta and provide blood to the myocardium and other components of the heart. The system is composed of a left and right coronary artery (Betts et al., 2013). On the other hand, coronary veins provide venous drainage from the heart, removing waste products and carbon dioxide (Weinhaus & Roberts, 2009).

2. Pathophysiology and clinical presentation of coronary heart diseases

CHD, the most frequent form of cardiovascular diseases, is the result of atherosclerosis, a pathological process that takes place in the walls of blood vessels (Mendis et al., 2011). In atherosclerosis, fatty material and cholesterol form plaques causing the inside of the blood vessels to become more narrow and less flexible with time (stenosis). Therefore, blood flow is partially or totally blocked (Centers for Disease Control and Prevention [CDC], 2019). The restriction of blood flow in the coronary blood vessels of the heart causes a condition that is called ischemia. Ischemia leads to hypoxia, the process where cells receive insufficient amounts of oxygen, which can lead to the death of the heart's muscle cells (Betts et al, 2013). Eventually, a plaque can also rupture and form a blood clot. That blood clot can develop in a coronary artery, and lead to serious consequences (Mendis et al., 2011).

Most individuals having a CHD report pain that radiates from the chest when doing an effort or physical activity: this is angina pectoris (Betts et al., 2013; NHLBI, n.d.-b). When a person is at rest, there might be enough oxygen supply in coronary arteries. However, when a person makes an effort that requires more oxygen, blood supply might then become insufficient, leading to angina pectoris. Chest pain is a sign of the existing underlying CHD (WHO, 2017). For some patients, the pain that

normally results from myocardial ischemia is not felt. This is called silent myocardial ischemia (Cohn, Fox & Daly, 2003). Angina can be stable and unstable when the condition of angina gets worse. When angina becomes unstable, it is a medical emergency. In fact, unstable angina can lead to a myocardial infarction (NHLBI, n.d.-b).

Myocardial infarction, which we will refer to by the term [MI], often called heart attack, is due to a significant and sustained ischemia (Mendis et al., 2011) and is generally an acute manifestation of the CHD provoked by atherosclerosis. When a coronary artery is blocked by an atherosclerotic plaque, or when an unstable atherosclerotic plaque travels through the coronary arterial system and lodges in smaller vessels, blood flow is reduced and the lack of oxygen causes the death (necrosis) of the myocardial tissue (Betts et al., 2013; Mendis et al., 2011). The main symptoms of MI include: chest pain or discomfort; feeling weak, light-headed or faint; pain discomfort in the jaw, neck or back, in one or both arms or shoulders; and shortness of breath (CDC, 2020). MI can be more or less dangerous, depending on the extent of necrosis and associated complications, but can lead to death.

The acute coronary syndrome [ACS] is a medical urgency. As the heart tissue is dying, it requires immediate medical care (American Heart Association, [AHA] 2015). To confirm the presence of a MI, one can look at the patient's electrocardiogram [EGC] that records the heart's electrical activity: a MI will generally reveal alterations in the ST and Q-segments of the electrocardiogram trace. Frequent classifications of MI include the STEMI (ST-elevated MI, characterized by a complete blockage in a coronary artery) and non-STEMI (non-elevated MI, characterized by a partially blocked artery and reduction of blood flow) classifications (AHA, 2016; Betts et al., 2013).

All patients suffering from a CHD do not follow the same clinical trajectory. Atherosclerosis generally develops at an early stage of life and progresses very slowly. People can live with this chronic disease for years without knowing it. Indeed, some patients are asymptomatic (Betts et al., 2013) or suffering from a "silent" coronary heart disease (NHLBI, n.d.-b). They do not suffer from any symptoms warning them or giving signs that they might suffer from a CHD, but still suffer from a chronic

disease. When people suffer from ACS like a MI, they are already at an acute stage of the disease, where fast interventions are needed, as the person's life is at danger. Today, several treatments have been developed to help preventing patients from suffering from a MI. Those will be developed in the section "possible treatments".

3. Risk factors of coronary heart diseases

Behavioral and metabolic risk factors are shown to play an important role in the development of atherosclerosis, the leading process causing CHD. Behavioral risk factors include tobacco use, physical inactivity, unhealthy diet as well as harmful use of alcohol. Metabolic risk factors include hypertension, diabetes, raised blood lipids like cholesterol and overweight/obesity. Other risk factors have also been established, like poverty and low educational status, advancing age, gender, and genetic disposition (Mehta, Wei & Wenger, 2015; Mendis et al., 2001). For example, in Belgium in 2016, among persons having suffered from a MI, 66.5% were men (Belgique en bonne santé, 2020). More and more studies also seem to show the possible influence of psychological factors on the development of atherosclerosis, like depression or stress (Mendis et al., 2011). Other studies in the psychological field, like the ones conducted by Friedman and Rosenman (1959), have focused on personality, noting the possible existence of "coronary-prone" patients showing a certain behavioral pattern they called the Type A pattern. Patients who present a Type A pattern are more impatient, aggressive, competitive, in desire of success and social acknowledgement, and would be more at risk of suffering from coronary artery diseases (Van den Broucke, 2018).

3. Main diagnostic tests and medical procedures

Today, many means have been developed in order to diagnose and treat CHDs. By parsimony, we propose to focus on three of them: Coronarography, which is a test developed to diagnose CHDs (other example of tests include the doppler ultrasound, electrocardiogram, echocardiogram, Holter or Event Monitoring) (Heart and stroke, n.d.-a), Percutaneous Coronary Intervention [PCI], and Coronary Artery Bypass Grafting [GABG]. Regarding treatments, many other treatments of heart diseases other

than the two we are going to detail here exist, including several forms of medications, or other surgeries and procedures (Heart and stroke, n.d.-b).

1. Coronarography

Coronarography is a selective form of angiography of the coronary arteries (Gach et al., 2019) that enables to diagnose CHD. A coronary angiography is a test used to show the inside of coronary arteries and a possible blockage of those arteries, by using a procedure called cardiac catheterization (NHLBI, n.d.-a). To do so, health care professionals insert, under local anesthesia, a thin and flexible tube through an artery to reach the heart and measure blood pressure and flow (CDC, 2019). This way, doctors can examine heart valves and inject a dye into the arteries to verify if those are narrowed or blocked (NHLBI, n.d.-c). Depending on the results of cardiac catheterization, the patient can be indicated to different kinds of treatments, including PCI and CABG (AHA, 2017).

2. Percutaneous Coronary Intervention [PCI]

PCI, also called angioplasty with stent (or coronary angioplasty), is a non-surgical procedure or intervention that uses a catheter to place a small structure (stent) into arteries where blood flow has been reduced or blocked. This allows a better blood flow and therefore reduces heart-related chest pain (Heart and stroke, n.d.-b). PCI is also used to reduce heart damage during or after a MI (NHLBI, n.d.-d). PCI requires cardiac catheterization: the doctor relies on live x-rays to guide the catheter to the heart, and injects a contrast dye highlighting the blockage. Then, to open a blocked artery, another catheter is inserted and a balloon is inflated at the tip of that catheter. This allows the doctor to put a stent (a small mesh tube) in the artery to help keep it open (NHLBI, n.d.-d). The inflation of the balloon is often sufficient to widen an artery where blood flow to the heart has been reduced or blocked. But most of the time, the implementation of a stent will be necessary to help the artery to pop open and decrease chances of yet another blockage of blood circulation (Heart and stroke, n.d.-b). PCI is a procedure that can be used in two major cases. On the one hand, PCI will be used in a preventive way. This means that a stent will be positioned once the patient has been

diagnosed with the chronic disease that is CHD: the stent is inserted in order to prevent MI. On the other hand, a stent can also be posited during an urgent situation. This is the case of the MI, where blood flow is reduced or blocked. At that point, PCI is an urgent procedure.

3. Coronary artery bypass grafting [CABG]

CABG, also called coronary artery bypass surgery or bypass surgery, is an intervention using blood vessels from another part of the body (patient's arm, leg, chest) and connecting it to the blood vessels below and under the narrowed artery (the narrowed or blocked vessels are bypassed) (NHLBI, n.d.-e). CABG is used to improve blood flow to the heart muscle. During the intervention, a heart-lung machine takes over the work of the heart that generally has to be stopped. The section of healthy blood vessel will be attached before and below the blocked artery before restarting the heart, allowing blood to pass through the bypass (Heart and stroke, n.d.-b). Depending on the severity and number of blockages, one or more vessels can be used (NHLBI, n.d.-e).

4. Consequences of the disease

1. Living with a CHD

Once a patient has been diagnosed with CHD, he/she needs to learn how to “live with it”. Patients need to follow a strict treatment plan that includes lifestyle changes, medicines, and procedures. Lifestyle changes may include trying to lose weight, staying physically active, eating healthy, learning to manage stress, quit smoking, and getting enough sleep. Also, a large series of medications can be recommended to manage risk factors or treat underlying causes of the disease (e.g. beta blockers) (NHLBI, n.d.-a). Next to this treatment plan, patients need to receive a routine medical care, and regularly visit their doctor. Often, patients will be referred to cardiac rehabilitation, helping them to manage symptoms, reduce risks of hospitalization and death, and improve their quality of life (NHLBI n.d.-a). It is a program that generally includes physical activity, health education and counseling

(CDC, 2019). Indeed, taking care of patient's mental health is an important issue regarding CHD. Emotions like stress, anger or anxiety, thoughts and behaviors do have an influence on the heart condition and success of treatment. It is therefore important that patients learn how to manage them (Heart and stroke, n.d.-c).

2. Life after a myocardial infarction

In Belgium, it is estimated that every year, 15 000 people suffer from MI and almost half of those MI are fatal (Ligue Cardiologique Belge, n.d.). But not all those suffering from CHD will have a MI, due to the possibility of prevention and early intervention. MI is a medical urgency that requires rapid intervention. Depending on how quick help has been provided, treatment can limit damage to the heart muscle and therefore improve patient's quality of life (NHLBI.-e). People who have suffered from a MI can lower chances of future health problems and suffering from a new MI by following similar recommendations as the ones described in the previous section (CDC, 2020). A MI can be life-threatening and, according to many studies (for a review, cf. Jacquet-Smailovic, Tarquinio & Houppe, 2020), is considered as a traumatic event for most of the patients. It is therefore frequent that different emotions such as acute distress and fear are evoked during this traumatizing event (Albarqouni, von Eisenhart Rothe, Ronel, Meinertz & Ladwig, 2016; Fang et al., 2016). Feelings of distress and fear during initial stages of an ACS are linked with depression and anxiety, which promotes poorer prognosis and greater morbidity (Whitehead, Strike, Perkins-Porras & Steptoe, 2005). Difficulties adjusting to their new lifestyle, feelings of depression and anxiety are frequent among patients having suffered from a MI (NHLBI, n.d.-e). As negative feelings during and after MI are linked to negative consequences on physical health as well, it is important to help patients with regards to their mental health.

5. Conclusion

In this first chapter, we have described what coronary heart diseases (or CHDs) are, by developing in a limited way the general anatomy and functioning of the heart. As our heart is a muscle, it needs to be supplied by its own vascular supply, which is

called the arterial supply (Weinhaus & Roberts, 2009). Sometimes, a pathological process can attack the inside of our blood vessels, called atherosclerosis (Mendis et al., 2011). If untreated, atherosclerosis can reduce or even block blood flow, provoking ischemia (Betts et al., 2013). This process can lead to a MI (Mendis et al., 2011). MI can be fatal. We proposed several risk factors central in the development of CHD, as well as the main treatments proposed to help face this chronic disease, like PCI or GABG. At the end of the chapter, we pointed to the fact that CHD and MI require a medical treatment and follow-up. Many patients who have suffered from a MI experience strong negative emotions such as distress and anxiety when faced with such an event (Albarqouni et al., 2016; Fang et al., 2016). Human beings have learned to develop ways in which to cope with such strong negative emotions. One of them is the use of denial.

Chapter 2 : The phenomenon of denial

1. Introduction

As human beings, we learn at already early stages of lives to use defenses. Defense mechanisms are automatic and unconscious mental operations that contribute to attenuate internal as well as external tensions (Chabrol, 2005). One of those defense mechanisms is denial. According to Jadouille (2006), denial can be described as not taking into account a threatening, uncomfortable or unwanted external reality. Denial has been studied within various theoretical frameworks (Goldbeck, 1997), mainly based on Freud's work (1925) in the psychodynamic field. Today it is postulated that denial could be more or less adaptative. In this chapter, we are going to focus on the concept of denial. First of all, we propose to define what defense mechanisms are, and how denial is one of those mechanisms, principally based on Freud's conceptualization. Then, we will precise how denial differs from other closely related and often confused terms. We will also describe how denial can be measured.

2. Denial as a defense mechanism

1. What are defense mechanisms ?

To comprehend what defense mechanisms are, we largely base ourselves on Cramer's review (2015): *Understanding defense mechanisms* and on Chabrol's paper (2005): *Defense Mechanisms*.

Psychoanalytical theories, that first discovered defense mechanisms, describe defenses or defense mechanisms as unconscious psychological mechanisms that reduce anxiety from an unacceptable or potentially harmful stimuli (Schacter, 2011). It is Sigmund Freud that first developed the concept of defense as being a general mental function that is part of the ego (Cramer, 2015). According to Freud and in his initial theories (Freud, 1923a, 1926), defenses serve two functions: to protect the ego against instinctual demands, and to avoid painful experiences. He also postulated that various defense mechanisms existed (Cramer, 2015). Anna Freud (1936) further divided the sources of the use of ego defenses into three specific motives, converging into the general purpose to protect the ego, by ruling off feelings such as anxiety or guilt (for a review, cf. Freud, 1936 and Cramer, 2015). Defense mechanisms are considered as a way with which humans are capable to resist to tensions, conflicts, perceived inner and outer danger (Chabrol, 2005), avoiding experiencing painful feelings or affects (Cramer, 2015).

Several classifications have been proposed to put order into all the defense mechanisms that exist. Two examples of main classifications that exist in current literature are 1) a classification based on the adaptive character of the defense, that distinguishes mature defenses, neurotic or intermediary defenses and immature defenses and 2) a classification based on the target of the defense, which can either be emotions or thoughts (Chabrol, 2005). However, both classifications have received many critics. In the DSM-IV (American Psychiatric Association, 1994), defense mechanisms were introduced through the Defensive Functioning Scale (Chabrol, 2005; Cramer, 2015). This scale consists of seven defense levels, organized hierarchically from adaptive to maladaptive. A total of 31 defenses are included in this scale (e.g.: denial, distortion, dissociation, projection, intellectualization, isolation,

repression, displacement, somatization) (Cramer, 2015). Other classifications of defenses exist, including the one of Vaillant (1992), which proposes four levels of defense mechanisms that are organized hierarchically: narcissistic, immature, neurotic and mature. According to this author, the higher level mature defenses are associated with more adaptive functioning than the lower levels (Cramer, 2015).

Defense mechanisms are not systematically pathological. Nowadays, it is postulated that several criteria have to be taken into account in order to decide on the adaptive character of defenses. The adaptive efficacy of a defense mechanism depends on its nature, but also on the intensity and flexibility in which it is implemented, as well as in the context in which the defense takes place (Chabrol, 2005). Generally, defenses become pathological when they are rigid, used with extensiveness, in many situations or with many people, when they are inappropriate or out of phase with the developmental level of the individual, or maladaptive to the current situation (Lichtenberg & Slap, 1972; Loewenstein, 1967; as cited in Cramer, 2015). Therefore, defense mechanisms could be both adaptive or maladaptive. At some level, the defense could indeed serve an adaptive purpose (to protect the human from excessive anxiety, to protect the self and self-esteem) (Cramer, 2015). It is still important to sometimes remember that, in fine, all humans use defenses to a certain extent. Even though many forms of defenses exist as explained in this section, for the purpose of this work, we will only focus on one of them: denial. The next section will give a general definition of this specific defense.

2. A definition of denial

Denial is an example of an ego defense. Many definitions can be given to explain what denial is. We propose to first mention the definition given by the American Psychological Association (n.d.-a, para.1) :

Denial is a defense mechanism in which unpleasant thoughts, feelings, wishes or events are ignored or excluded from conscious awareness. It may take such forms as refusal to acknowledge the reality of a terminal illness, a financial problem, an addiction, or a partner's infidelity. Denial is an unconscious process that functions to resolve emotional conflict or reduce anxiety.

We can also refer ourselves to the classification originally proposed in the DSM-IV (American Psychiatric Association [APA], 1994). This classification postulates that denial is a defense that belongs to the level of disavowal. The level of disavowal is constituted by defenses that maintain outside the consciousness factors of stress, impulses, ideas, affects or emotions of responsibility by attributing them or not to an external cause (Chabrol, 2005), like denial, projection, or rationalization. In the DSM-IV, denial is defined as a response to conflicts and stress, by not acknowledging painful aspects of the external reality or subjective experience that seem to be evident for others (APA, 1994). This means that denial can include a rejection of internal (psychic) as well as external reality. The level of disavowal is the third of the seven levels of the DSM-IV classification (Chabrol, 2005). If we are to rely on Vaillant's classification (1992), denial belongs to the narcissistic level, and is then rather called denial of external reality. It is considered as an immature defense mechanism.

Denial in the way we consider it in this thesis is different from psychotic denial (Chabrol, 2005). In psychotic denial, the subject refuses to acknowledge a physical object or a real event in his present experience. Psychotic denial is characterized by a major distortion of the internal or external reality, whereas in (neurotic) denial, the lack of awareness of reality is only appearing or incomplete, and may be non-permanent. In fact, people around the person who denies can sometimes feel like the subject "both knows and doesn't know" (Chabrol, 2005; Perry, Guelfi, Despland & Hanin, 2004).

Denial allows a person to actively and unconsciously exclude certain information from his/her attention (Chabrol, 2005). Denial aims at preserving the individual from something that he or she is not yet ready to face (Rossi Ferrario et al., 2017). As all defense mechanisms, denial can be adaptive when it is temporary, in situations of extreme stress or major trauma (Chabrol, 2005). For example, denial is a common reaction when in grief (Bowlby, 1997). It is also common that denial is used during childhood, and is then even considered as normal (Cramer, 2015). But denial can also be used excessively (e.g. in borderline personalities) or in an insufficient matter (e.g. in depression or melancholia) (Chabrol, 2005).

3. Denial according to different theoretical frameworks

Denial is a complex psychological concept, and many definitions of this concept have been proposed throughout psychological literature. As we can see from Goldbeck's work (1997), denial can be defined and contrasted according to several psychological frameworks. Indeed, it is the *psychodynamic framework* that first introduced the concept of denial. Freud (1923b) used the term "Verleugnung" to define the behavior of young boys that refused to recognize the absent of penis in little girls. He first described this phenomenon as being a central feature of psychotic illness (Freud, 1924) as well as fetishism. His daughter, Anna Freud (1961), defined denial of external reality as an often used mechanism by children to face non pleasant aspects of their external reality. According to her, denial was limited to an immature ego. Freud's theory seems to suggest that denial is an immature and pathological defense mechanism, which is also the point of view of Vaillant (1992) in his classification (Goldbeck, 1997). Next to this framework, other theories has developed definitions and nuances regarding denial, like the *cognitive framework* (Dorpat, 1983, Hamilton, 1983; as cited in Goldeck, 1997); the *organic framework*, namely referring to the phenomenon of anosognosia or the patient's unawareness of his neurological deficit(s) (e.g. Babinksi, 1914; as cited in Goldbeck, 1997); the *interpersonal framework*, notifying the important interpersonal aspects of denial (Robinson, 1993, Weisman, 1972; as cited in Goldbeck, 1997) and postulating that denial could be used to preserve important interpersonal relationships; and finally the *clinical framework*, proposing various indicators to operationalize denial (e.g. denial of cognitions, affects, or illness) (Goldbeck, 1997). Denial is an abstract and complex term and still needs clarification, as it has adopted different meanings depending on its context it is studied in (Goldbeck, 1997).

4. A precision of terms

Freud used the term "Verleugnung" to define a defense mechanism used by patients that refused to acknowledge reality to some extent (Freud, 1923b). Many discussions have taken place concerning the right way to translate the term Verleugnung into English as well as other languages (Adam, 2005). Verleugnung is usually translated as "disavowal" or "denial", whereas "Verneinung" is usually

translated as “denial” or “abnegation”. It is important to make a distinction between both terms. In Verleugnung (non-acceptance of reality), the person acknowledges that two contradictory things can coexist (the “yes” and the “no” do not exclude one another). This mechanism is unconscious and due to the ego that wants to defend himself against an unwanted reality (because of internal conflicts resulting from impulsive dangers). Verleugnung is central to pathologies such as fetishism or psychoses, where reality is denied and replaced. In Verneinung (denegation/abnegation), the person acknowledges the repressed. He admits it intellectually, *but not affectively*. The subject remains ignorant of what provoked the repression (Adam, 2005). Therefore, we can say that Verneinung is a process of active (de)negation, implying a contestation or refusal to admit (Janne, Reynaert & Cassiers, 1990).

Some authors that use the term denial omit to distinguish both terms or to consider what is called the topical point of view. For example, Hackett and colleagues (1968, p.94) defined denial as “the conscious or unconscious repudiation of part or all of the total available meaning of an event to allay fear, anxiety or other unpleasant affects”, meaning their definition implies other defense mechanisms such as displacement, projection and rationalization (Janne et al., 1990). In other fields of psychology such as social or cognitive psychology, the term “self-deception” is also used. Sometimes, denial is referred to more as a coping-style, which states this phenomenon as being rather an adaptive behavior than a defense mechanism (Jamner & Schwartz, 1986; Lazarus, 1983; as cited in Janne et al., 1990). As we can see, denial remains an unprecise concept including one to several psychological mechanism that are at work in any situation that could include a discordance between two kinds of logics: symbolic & physiological (Goldbeck, 1997; Janne et al., 1990).

We acknowledge the fact that the term denial still is unclear in current literature. Deny may be deliberate or defiant, or more of an unconscious process (Morehead, 2002; as cited in Covino, Stern & Stern, 2011). We postulate that there might exist a more conscious form of denial, and it is this form that we want to focus on in this thesis. Current literature indeed focuses more on denial as being a coping strategy.

5. Conclusion

Defense mechanisms are unconscious psychological mechanisms that reduce anxiety when faced with an unacceptable or potentially harmful stimuli (Schacter, 2011). Those defense mechanisms can be more or less pathological or adaptive, depending on several criteria (Chabrol, 2005). Many classifications are proposed in order to classify and define the many existing defense mechanisms we know. One of those defense mechanisms is denial. Since its first developments by Sigmund Freud, many authors have developed and extended the conceptualization of denial, leading sometimes to misunderstanding when it comes to explaining what denial is and what it is not. The still existing problematic of understanding the right translation to use of the original terms used by Sigmund Freud adds to this difficulty.

Denial has been investigated in many different frameworks. One of those frameworks is a psychosomatic approach, focusing on the relationships that exist between physical and mental health. Among patients suffering from coronary heart diseases, denial seems to be a frequent mechanism that is used in order to face this disease and its consequences. The next chapter will further develop how denial can be a more or less efficient defense to use in order to deal with CHD.

Chapter 3 : Denial as a means of coping with coronary heart diseases

1. Introduction

Denial is a defense mechanism that is used among patients suffering from a serious or chronic disease. Coronary artery diseases is one of the fields where denial has been studied the most (Sirois, 1992). Denial is a coping style that is available to help patients facing the anxiety and stress resulting from a disease. When people deny, they minimize or annulate a part or the totality of the reality or its significations (Jadoulle, 2006). Denial could be considered as a transitory adaptative strategy to use when faced with an unbearable reality (Jadoulle, 2006) and as having beneficial effects (Fang, 2016). But denial may also become detrimental in the longer term.

This chapter will include information about the value of taking an interest at this defense mechanism based on a psychosomatic approach. We will explain how different forms of denial can be observed among coronary patients. Information will also be provided about the ways in which denial is commonly assessed among patients. We will also nuance the short and long term consequences of denial on both physical and mental health.

2. Selection of the relevant articles

To find relevant articles and studies that address the use of denial as a coping or defense mechanism to deal with the negative consequences of living with a CHD (chapter 3 and 4 of this thesis), we conducted our research on the following databases: Pubmed, Scopus, Embase, Sciencedirect as well as Cairn. Several keywords were used based on the subject that was searched, and those included: coronary heart disease, coronary artery disease, cardiovascular disease, MI, myocardial ischemia, denial, psychological, coping mechanism, defense mechanism, social support, psychosomatic, anxiety, stress. We only selected articles that were written in French or in English. References of the articles that were read were also consulted.

3. A psychosomatic approach

The psychosomatic field of medicine is interested in the interactions of mind and body. More specifically, it focuses on “the role of the mind (psyche) in diseases or disorders affecting the body (soma); specifically, the role of psychological factors in the etiology and course of pathology in bodily systems” (American Psychological Association, n.d.-b, para. 1). Understanding how denial can influence mental as well as physical health of the patient suffering from CHD is an interesting pathway for research (Jadoulle, 2006). The coronary psychosomatic model attempts among others to explain the detrimental effects of stress and the beneficial effects of denial on the patient’s physical as well as mental health. Indeed, denial can for example protect the patient from the stress caused by the disease. Therefore, many studies (e.g. Albarqouni et al., 2016; Fang et al., 2016; Folks, Freeman, Sokol & Thurstin, 1988; Ketterer et al., 2016) have already evaluated the impact of denial in case of somatic diseases,

following a psychosomatic approach. Some results of those studies will be accounted for in this chapter's point 6.

4. The behavior of a denying patient

Different authors (e.g. Hackett & Cassem, 1974; Janne et al., 1990; Sirois, 1992) have already noted that several forms of denial exist when it comes to physical illnesses. Indeed, denial is a multidimensional phenomenon (Covino et al., 2011). For example, according to Goldbeck (1997), the patient who denies can 1) not accept his diagnosis or appear oblivious to it 2) minimize the implications of his/her illness 3) delay seeking for medical advice 4) refuse to comply to treatment 5) or appear unperturbed in the face of his/her illness. Equally, in his book "*The denial of stress*" (1983), Breznitz postulates that seven kinds of denial exist: denial of information, denial of threatening information, denial of personal relevance, denial of urgency, denial of vulnerability/responsibility, denial of affect and denial of affect relevance. He distinguishes these types of denial based on the quality of denial that surrounds illness (Covino et al., 2011).

When it comes to CHD, patients might even deny suffering from the disease. Denying the disease in itself leads to the consequence that many patients consider their MI or a surgical intervention as an "accident", an exterior event rather than a personal experience that results from one's lifestyle and history (Janne et al., 1990). Shaw, Cohen, Doyle & Palesky (1985) provided evidence for the fact that patients that denied when they had to be hospitalized due to a MI were less good in learning about the anatomy and physiology of the heart, the symptoms that accompany heart disease and how to ameliorate their lifestyle in order to face risk factors and to improve their revalidation. In another study conducted by Croog, Shapiro and Levine (1971), 20% of the patients having suffered from a MI denied, 3 weeks later, having "had" a cardiac disease, even though some of them passed by an intensive care unit. Patients who deny might also deny the utility of the medical treatment, like refusing coronary artery bypass grafting, even though it is medically indicated (Janne et al., 1990). For the interested reader, in a recent article, Covino and colleagues (2011) propose a case presentation of a man who denied the significance of acute and intense chest pain. This

case illustrates how a patient suffering from CHD can deny his medical reality. We will also propose one in the appendix (cf. *appendix – proposition of case study*).

Denying one's illness can lead to serious consequences. Those can be both detrimental or beneficial, depending on the duration of its use (*infra*). But in order to pay attention to the implications of denial, one first has to evaluate whether a patient denies or not. To do so, many tools have been developed.

5. Assessment and significance of denial in coronary diseases

Although many critics have been given to the methods of assessment of denial in clinical literature (Goldbeck, 1997; Sirois, 1992), mainly due to the ambiguity of the term “denial”, several methods of assessment of denial have been developed. Professionals can rely on clinical judgement in order to define whether a patient is denying his illness (e.g. Hackett, Cassem & Wishnie, 1968), like in Miller and Rosenfeld's Degree of Illness Questionnaire (1975). Semi-structured interviews or observer rating scales, like the Levine Denial of Illness Scale (Levine et al., 1987) or the interview proposed by Hackett & Cassem in 1974 (*infra*) also form an often used method to assess denial. More recently, self-reporting questionnaires have been developed in order to evaluate presence of denial (e.g. Fowers, 1992). It is even possible to rely on psychophysiological measures (Goldbeck, 1997) to assess denial. Finally, denial among medical patients has also been assessed by using the measure of self-deception of the Eysenck Personality Inventory (Covino et al., 2011; Jamner & Schwartz, 1986). In the next paragraphs, we propose to detail two measures used to measure denial.

One of the most used tool to assess denial in coronary diseases is probably the Hackett & Cassem Denial Rating Scale (1974). This scale consists in structured questions combined into an interview. The interviewer rates patients based on a 31-item scale, indicating behaviors that patients typically have when they deny important illnesses (Wigger, 2011). Hackett & Cassem (1974) have proposed a classification of patients into three categories, depending on the intensity of their denial: 1) the ones operating in major denial, that admit no fear 2) the ones partially using denial 3) the ones operating in minimal denial, most of the times anxious patients (Hackett &

Cassem, 1968; Sirois, 1992). Another example of measurement of denial is the Illness denial questionnaire [IDQ] for patients and caregivers (Rossi Ferrario et al., 2017). This questionnaire is unique in that it is a self-report measurement that proposes items to assess patients' *and* caregivers' denial in relation to their illness. This measure postulates a theoretical model of denial based on three dimensions: denial of negative emotions, resistance to change and conscious avoidance. Together, denial of negative emotions and resistance to change form actual denial. According to the authors, conscious avoidance is an independent component representing the behavior of the person who denies his illness. The IDQ is one of the most recent measures developed to assess denial and does not refer to one illness specifically (Rossi Ferrario et al., 2017).

The problem with measures of denial is that there is little to no standard or well-validated measure of denial currently existing (Wigger, 2011). As a result, studies that have assessed consequences of denial in coronary patients often find contradictory results. This is also due to the complexity of denial: it has adopted different meanings in different contexts (Goldbeck, 1997). Denial should also be assessed longitudinally. Indeed, for example, Hackett & Cassem's scale only focuses on denial in acute phases. However, denial should be assessed several times (also in long-term) and with several means (Sirois, 1992), as it can fluctuate throughout time.

To conclude on this chapter's point, it is hard to say exactly which proportion of patients actually denies. Some studies and measures classify patients in deniers and non-deniers (e.g., Fang et al., 2016), establishing that a more or less important number of CHD patients deny (e.g. 42.03% of deniers in the study of Fang and colleagues, 2016; 14 out of 26 patients in the study of Levenson, Kay, Monteferrante & Herman, 1984). Other studies use continuous measures of denial, establishing mean values of denial using a series of measures and among different groups of patients (e.g. Albarqouni et al., 2016; Perkins-Porras, Whitehead, Strike & Steptoe, 2008) and showing that there often is a high variability of denial among patients.

6. Consequences of denial

As told by Hackett & Cassem (1982; as cited in Wigger, 2011, para. 4.) “denial is one of the first adaptive behaviors or mechanisms that an individual uses during the stress-producing event of an acute episode of chest pain”. Denying that one suffers from the illness, or denying the possible consequences of that illness, can lead to serious consequences on both physical and mental health. The studies assessing the short and long-term effects of denial have provided evidence for the fact that denial can either be detrimental or beneficial, and this partly depends on the length of the use of denial. As explained in the previous paragraphs, it is important to remember that many contradictory results have been found when it comes to assessing the consequences of the use of denial. Therefore, the results we present in the next paragraphs need to be nuanced. Several criteria also need to be taken into account in order to determine whether denial is or not adaptive (Goldbeck, 1997; Lazarus, 1983).

1. On mental health

Different studies have provided evidence for the beneficial effect of the use of denial among patients suffering from coronary heart diseases when it comes to mental health. For example, in 1974, Froese, Hackett, Cassem and Silverberg conducted a study assessing trajectories of anxiety and depression in 36 denying and non-denying acute MI patients during hospitalization. Authors assessed denial by using the Hackett-Cassem Denial Rating Scale. 17 patients were classified as deniers and 19 as non-deniers. Anxiety and depression scores were also assessed at different time intervals during their hospital stay. It seemed that anxiety and depression scores declined more rapidly for deniers than for non-deniers. As discharge approached, anxiety and depression scores rose among all patients, but the deniers countered this rise by a greater mobilization (and rise in score) of denial. These results let us think that denial functions as a remedy against anxiety and depression (Sirois, 1992).

More recently, other studies have also focused on the effects of the use of denial on mental health. In 2016, Fang and his colleagues assessed whether denial is a maladaptive coping mechanism among patients with an ST-segment elevation MI (STEMI), a traumatizing and life-threatening event (Albarqouni et al., 2016). 533

patients were included in the study. The denial measures used was the Cardiac Denial of Impact Scale (Fowers, 1992). Based on their scores on this scale, patients were divided in deniers and non-deniers. Psychological measures included anxiety, depression, well-being and type D personality (Denollet, 2000). Behavioral responses included behavioral, cognitive and emotional responses to the symptoms. The results of their analyses confirm a potential protective effect of denial, as denial was associated with lower levels of depressed mood, anxiety, and higher levels of well-being. No major differences were found when it came to behavioral consequences.

As we can see, it seems that at early stages of the disease, denial can have a protective effect for the patient. Indeed, studies find that patients suffering from coronary heart diseases who deny are more likely to suffer *less* from general negative affectivity (anxiety, depression). Presenting less negative affectivity has important implications for CHD patients. As noted by Rozanski and colleagues (1999), psychological factors largely play a role on the pathogenesis and evolution of cardiovascular diseases. This can be explained by behavioral mechanisms, exacerbating lifestyles known to negatively influence coronary heart diseases, but also direct pathophysiological effects. It also seems that anxious individuals are more prone at developing coronary heart diseases. Anxiety can have a significant influence on the patient's health, often leading to adverse cardiovascular outcomes (Celano et al., 2016; Modica et al., 2018; Rozanski, Blumenthal & Kaplan, 1999). In this means, denial can play a protective role at the early stages of coronary heart disease, as it diminishes anxiety and depression. Denial then becomes an effective adjustment strategy or way to cope with the stress that is provoked by the disease.

2. On physical health

Using denial, a psychological mechanism, can, as mentioned above, have effects on patient's physical health: it can either ameliorate or deteriorate it. For example, it has already been shown that psychological factors like stress or depression can have an influence on the development of atherosclerosis, which often leads to CHD (Mendis et al., 2011). And as outlined in the previous paragraph, denial is a mechanism that modulates psychological phenomena such as depression or stress.

In their 2016's study focusing on denial as a coping mechanism for patient suffering from MI, Fang and his colleagues found that denial contributed to less acute heart related reported symptoms such as pain severity, racing heart or shortness of breath, even though severity of infarction was the same. In their study, authors also evaluated associated behaviors, and denial did not lead to maladaptive behaviors. Therefore, according to this article, denial is seen as protective and beneficial mechanism as it contributes to less heart related-symptoms without leading to maladaptive behaviors (Fang et al., 2016).

The use of denial among patients suffering from CHD can also lead to other consequences. Many studies have, for example, focused on pre-hospital delay among patients suffering from acute MI (Lee et al., 2020; Nilsson, Mooe, Söderström & Samuelsson, 2016; Perkins-Porras, Whitehead, Strike & Steptoe, 2009), as rapid medical intervention is a key component of treatment of patients suffering from CHD (Moser et al., 2006; as cited in Perkins-Porras et al., 2009). Pre-hospital delay can be defined as “the time between onset of symptoms suggestive of MI and admission to the hospital” (Nilsson et al., 2016, p.4). Results of different studies suggested that denial generally leads to significant pre-hospital delay among patients suffering from a MI (Fang et al., 2016; O'Carroll, Smith, Grubb, Fox & Masterton, 2001; Perkins-Porras et al., 2009; Stenström et al., 2005). For example, in 2005, Stenström and colleagues conducted a study assessing denial among first-time MI patients. 107 patients were included in their study and they were divided in two groups: delayers and non-delayers. Measures of denial were included based on the Hackett and Cassem semi-structured interview. The results showed a significant association between prolonged delay and greater use of denial. Denial can here be seen as having a clinically meaningful impact: patients who deny their illness or the symptoms related to them are more likely to delay seeking medical help. This often leads to negative consequences for patients suffering from CHD and more precisely MIs, as time is of essence when suffering from it.

Other “negative” behaviors that have been associated with the use of denial among patients suffering from CHD include non-adherence to treatment and rehabilitation programs. When a patient does not acknowledge the significance and/or importance of his disease, it is probable that he/she will be less inclined to follow

medical recommendations. As explained by Jadoulle (2007), at longer term, denial among coronary patients can have an unfavorable effect on the organic evolution of the patient, as it can impair access to care and adherence to treatments. In 1987, Levine and his colleagues already provided evidence for this: in their longitudinal study investigating relationships between denial of illness and the course of recovery of the patient, it seemed that at short term, higher deniers spent less time in the intensive care unit and presented fewer signs of cardiac dysfunction, but at a longer term (in the year following discharge), higher deniers were less compliant with medical recommendations and were re-hospitalized for longer times (Levine et al., 1987). The results of this interesting study underline the importance of using longitudinal studies and focusing on the time-differential effects of denial in physical illnesses.

3. Time-differential effects

Denial has different effects when we look at short term and long term (Sirois, 1992). Indeed, at short term, denial is an emergency mechanism that helps coping with the stress caused by the trauma and surprise of the sudden arrival of the disease. This urgency phenomenon leads to beneficial effects of the use of denial: denial helps controlling anxiety at short term. However, if this same mechanism is maintained at longer term, the results become negative as they testify of the non-integration of the disease and the necessity to adopt attitudes and behaviors to deal with this disease. This has also been established in Golbeck's article (1997), that notes that different results can be found when it comes to links between denial and medical outcomes, and for the need to consider the time course of denial: denial could be adaptive at early stages, but become maladaptive if maintained.

7. Conclusion

In this third chapter, our aim was to take a closer look at the main findings of the current literature when it comes to the use of denial among patients suffering from a CHD, following a psychosomatic approach. We provided information about the different forms of denial that can be observed in coronary patient's behaviors, the way we can assess denial in this specific context and the consequences of the use of denial.

Many different studies have assessed denial among coronary patients, the first studies having emerged from the early work of Hackett & Cassem (1968). Since then, many authors have focused on denial and its relationships to the physical illness that CHD represents. But the uncertainties that remain when trying to define denial and the variety of measures that have been developed to assess the latter have often lead to contradictory results. At short term, denial can be beneficial for the patient as it has positive effects on both physical and mental health. But, at longer term, it seems that denial can lead to serious negative consequences.

As many studies have assessed what behavior a denying patient can adopt when suffering from a coronary heart disease, or the consequences of the use of this psychological mechanism, less studies have tried to understand the reasons that lead patients to deny. This will be the subject of this fourth and last chapter of our theoretical part, leading us then to our research question.

Chapter 4 : Why do some patients deny more than others ?

1. Introduction

It is now clear that denial is a frequent psychological mechanism used among patients suffering from coronary heart diseases to help them deal with their disease as well as its negative consequences. Some studies have tried to target specific groups of patients who might be more inclined at denying, focusing on sociodemographic variables such as gender or personality. However, great uncertainties still remain when it comes to the more concrete reasons that lead patients to deny and how to characterize deniers. Understanding the reasons that lead to denial and the typical characteristics associated to it is an interesting subject for future research: it could give us a better comprehension on the interventions to develop to help facing denial, when this mechanism becomes maladaptive for the patient.

The objective of the last chapter of our theoretical part is to shed a light on those questions. After giving some brief information on the main characteristics of denying coronary patients that have been underlined in current literature, we will focus

on more determinants that could explain why some persons deny more than others. Two main elements will be targeted, leading us to our research questions: the specific event of the MI, and the role of the patient's interpersonal context.

2. Characteristics of the denying patient

One way to take an interest at the phenomenon of denial among patients suffering from CHD is to try to define which main characteristics a “typical” coronary denying patient may have, such as sociodemographic characteristics. In the study of Fang and his colleagues in 2016 (one of the few that has investigated sociodemographic characteristics of deniers) assessing the use of denial among 533 ST-elevated MI patients, one of the objectives was to do so. Authors found that deniers were more likely to be younger patients, and to be male. It also seems from their study that deniers were less likely to be alone. The authors pointed that these young age and male sex generally contributed to early arrival at hospital (Ladwig et al., 2011), but that living alone contributed to delay, in accordance with what was explained in the previous chapter of this thesis. In the same article, *no* differences were found between high and low levels of denial regarding medical history of the patient post-acute infarction phase (intensive care, complications and cardiac arrest) on outcomes of denial, “suggesting that the severity of the infarction had no significant association with denial” (Fang et al., 2016, p.70).

The result that males seem to deny more than women has been found in other studies and among other diseases such as lung cancer (e.g. Ketterer et al., 2004; Vos, Putter, van Houwelingen & de Haes, 2010), and is consistent with the current knowledge that women are more forthcoming about their emotional distress than men (Janne et al., 1987; Janne, 1988; Ketterer et al., 2004). Another interesting result is that deniers are more likely to be accompanied, or in a relationship. This result points to the importance of the interpersonal context of the patient, as we will detail in the fourth point of this chapter.

As explained by Wigger (2011), not many research has been conducted on possible other determinants of denial, such as social determinants or personality. According to the psychosomatic approach, focusing on personality factors is an

interesting lead to follow (Cosci, 2012). Several studies have tried to establish a link between CHD, denial, and personality. In his article “*Type D personality – A potential risk factor refined*” (2000) Denollet urges for the adoption of a personality approach in order to target patients at risk of cardiac complications. He mainly refers to the “distressed” type or type D personality, a frequent form of personality among cardiac patients. This personality is characterized by the experience of negative emotions and the inhibition of self-expression (Denollet et al., 1996). Other personality types, such as the type A (Janne, 1990), characterized by an obsessive structure, have been linked to CHD as well as denial. Patients presenting a type A personality have a need to maintain a personal control, as well as to maintain a good image of themselves (Van den Broucke, 2018). According to Janne (1990) and in accordance to this, denial could serve a function of self-mastery maintenance. Evaluating personality next to denial is of the essence for patients suffering from CHD: some personality subtypes of coronary patients are more at risk of having psychosocial risk factors as well as long-term cardiac events (Denollet, 2000).

3. Functions of denial

Clinicians are aware of the phenomenon of denial, but the reasons why this defense mechanism is used, and more precisely in the case of patients suffering from coronary heart diseases, are less clear (Cousins, 1982; Shelp et al., 1985, Beisser, 1979; as cited in Covino et al., 2011). As explained by Janne and colleagues (1999), if one adheres to a finalist or functionalist approach, we need to understand how denial has a certain interest for the subject who uses this defense mechanism. Denial has to have a certain utility, a “reason to be”.

We have decided to focus on two specific fields in order to understand the functions denial serve (next to assessing sociodemographic factors). First of all, our objective is to analyze the use of denial specifically among patients having suffered from a MI. Indeed, this traumatizing event could lead to strong and distressing emotions that the patient may want to deny. Even though most of the existing literature on denial in coronary patients focuses on MI as a specific event to take into account, less studies have focused on the interpersonal context of the patient. It seems important to also consider the patient’s entourage in order to understand the use of denial. Denial

could have a protective function for the patient's close relatives. Our objective will be to shed a light on the role the patient's close relatives play in the use of denial.

4. Myocardial infarction: an acute event

As explained in the first chapter of this thesis, suffering from a MI is an unexpected and traumatic event, that faces people with their mortality (Fields, 1989). Patients that undergo acute coronary syndromes often perceive intense distress (Jacquet-Smailovic et al., 2020; von Känel, Hari, Schmid, Saner & Bègré, 2011). For example, in a study assessing frequency of distress and fear of dying during acute coronary syndromes among 184 patients, 73.3% of the patients indicated suffering from moderate or intense distress and fear of dying (Whitehead et al., 2005). Patients who experienced more distress during acute coronary syndromes seemed to show higher levels of anxiety and depression one week later, and elevated levels of depression at 3 months (Whitehead et al., 2005). Another study among 20 patients suffering from an acute coronary syndrome showed that acute stress symptoms, depression, negative affect, hostility, and pain scores were independent predictors of three-month PTSD symptoms (Whitehead, Perkins-Porras, Strike & Steptoe, 2006).

Several explanations can be given as to why MI is such a traumatic event. First of all, it is a life-threatening, unexpected situation that faces patients with the fact that they are mortal (Fields, 1989). The symptoms that patients experience during such an acute event, like sudden chest pain, shortness of breath, cold sweating, nausea/vomiting, or feeling lightheaded (NHLBI, n.d.-a) can also trigger strong emotions like anxiety or panic attacks (Ligue Cardiologique belge, n.d.), as it is a natural reaction to fear (Mikolajczak, 2013). When a patient is admitted to hospital with such symptoms, he will often undergo several medical examinations as well as receive treatments. Those interventions, combined to the MI itself, often damage the image of the body and the way the individual invests it (Mikolajczak, 2013), as at hospital, the body is reduced to its organic functions (Marchetti, 2012). The medical examinations performed (stress test, coronarography, angioplasty) may provoke stress and anxiety (Société française de cardiologie, 2007). It is also important to take into account the stressing environment that the intensive care unit represents, when a patient is admitted in this unit. Indeed, as explained by Hackett & Cassem in their

Handbook of General Hospital Psychiatry (1987), the intensive care represents a unique setting combining specific sets of caregivers, physicians, and nurses. The authors describe this setting as being particular, associating danger, urgency and heroism. Being admitted to an intensive care unit is without exception associated with a life-threatening disease. Patients can fear death, the illness, or its treatments (Hackett & Cassem, 1987).

Patients may cope with the fear caused by MI using denial (Albarqouni et al., 2016; Covino et al., 2011; Fang et al., 2016; Fields, 1989). Denial helps the person that is acutely ill to ward off panic, as the denier minimizes or excludes the implications of his disease (Hackett et al., 1968). Denial is useful in order to cope with the symptoms experienced when suffering from a MI (Fields, 1989). At the acute and early stage of MI (during hospitalization), denial is a functional and adaptive coping mechanism for the patient (Bar-On, 1985; Fields, 1989). The MI represents a crisis, and denying is an effective mechanism to adapt to the stress caused by this crisis (Froese, Hackett, Cassem & Silverberg, 1974). Adopting this point of view means understanding that denial has a pragmatic and psychosomatic finality (Janne, 1988), reducing anxiety and favoring survival (Weismann et al., 1961; as cited in Janne, 1988).

5. An interpersonal perspective

Taking the patient's entourage into account is of the essence in order to understand denial. Denial could indeed have a finality beyond and above the patient alone (Janne, 1988), serving as a protection in the coronary patient's interpersonal relationships (Goldbeck, 1997). When a patient having a CHD, and more precisely suffering from a MI, is hospitalized, he/she is often accompanied by a significant other (e.g. a spouse). Hypotheses suggest that denial could serve an interpersonal function as it saves the patient's entourage from anxious representations (Goldbeck, 1997; Janne, 1988; Janne et al., 1988; Sirois, 1992). In the next paragraphs, we will outline some studies shedding light on the importance of the interpersonal context of the patient.

Often, the patient that denies indicates his entourage as suffering the most from his clinical situation/condition. This is called displacement. For example, in a study conducted by P.Janne and his colleagues in 1988, among 240 patients interrogated about their fear for cardiac surgical intervention, 111 answered they did not fear the intervention. Among those 111 patients, 77.5% designated their significant other as suffering the most from the situation. We here observe a mechanism of hyperprotection (Janne, 1988). In the same vein, Clarke and colleagues (1996) found that perceived overprotectiveness by the patient having suffered a MI is positively related to the patient's scores on anxiety and depression. Patients who felt overprotected by their wives were also less optimistic about their recovery post-MI. Patients who are hospitalized are rarely the only ones suffering from their medical situation.

The relationship between the patient's denial and the close relatives' anxiety is not new to literature in (health) psychology. For instance, in Brogniez' thesis (1998) assessing the validity of the model of Kübler-Ross (stages of bereavement) among patients hospitalized in palliative care units, different measures including measures of the patient's denial and the anxiety of the family were taken. Results showed that the scores of familial anxiety were positively correlated with the scores of denial. In other words, the more the family seemed anxious, the more the patient seemed to deny his illness (as measured by healthcare professionals).

Janne and colleagues' 1988 article, which focused on silent ischemia (when a patient suffers from ischemia but without knowing it or without anginal symptoms; Gul & Makaryus, 2020), proposed a new form of evaluation of the symptoms including the spouse, that is "... often more forthcoming about the patient's symptomatology than the patient is himself" (Janne et al., 1988, p.21). Their study showed that there existed a discrepancy between the patient's responses and the responses of his significant other when it comes to evaluation of symptoms. Implications of this study include the possibility that the family environment of the patient plays a role of compensatory alarm mechanism among silent MI patients (by palliating the absence of pain warnings) (Janne et al., 1988).

Lastly, some studies noted that patients that had suffered from a MI were more likely to deny when living with someone (e.g. Fang et al., 2016). It is often the patient's entourage or the patient's close relatives that urges them to seek medical assistance when they have signs of ischemia. For example, in his article *MI and denial*, Fields (1989) mentions the case of one of his patient delaying to seek medical care when suffering from a MI. Even though he felt classical symptoms of MI such as chest pain, dyspnea and diaphoresis 24 hours before coming to hospital, "...he insisted he felt no weakness and that he had only come because of his wife's urging" (Fields, 1989, p. 158).

The previous paragraphs emphasize the importance of taking into account the patient's entourage when it comes to denial. They can either play a protective role for the patient, as they encourage them to consult, but they can sometimes become overprotective or too anxious, urging the patient to hide his emotions (to deny ?) in order to protect, in turn, his entourage.

6. Conclusion

In this last chapter of the theoretical part of this thesis, we wanted to take a closer look at the coronary patient's concrete reasons to deny. First, we have acknowledged the main characteristics that are associated or representative of denying patients suffering from CHD. We have also noted that some types of personalities could be associated with the use of denial. When it comes to understanding the functions that denial serve among coronary patients, literature is less clear. Indeed, as explained by P. Janne (1988), several functions have been proposed, but all of the proposed explanations seem coherent in their own way. As literature has often focused on the consequences of this mechanism, less have concentrated themselves on the characteristics of deniers. This is what we want to focus on in our work.

Conclusion to the theoretical section

Throughout this theoretical section, we overviewed the importance of the phenomenon of CVDs and more specifically CHDs throughout the world (WHO, 2017). We have first taken a closer look at the anatomy and functioning of the heart, to understand how CHDs can develop themselves. Atherosclerosis is a pathological process in the walls of blood vessels, that causes CHDs. An acute manifestation of this process, causing sustained ischemia, is MI (Mendis et al., 2011), a medical urgency (AHA, 2015). Some risk factors of CHDs have been highlighted, such as behavioral, metabolic or sociodemographic risks (Mehta et al., 2015; Mendis et al., 2011). Psychological factors also seem to play a role on the development of CHDs, like the type A or type D behavioral patterns (Denollet, 2000; Friedman & Rosenman, 1959). To diagnose and treat CHDs, different methods are used in medical care. We have outlined three of them: the coronarography, PCI and CABG. In the first chapter, we have also noted the consequences of the disease, like the need to adhere to a strict treatment including lifestyle changes, to receive medical treatments and to see the doctor regularly (NHLBI, n.d.-a). After having suffered from a MI more specifically, mental health can be affected, as it causes emotions such as depression or fear (Albarqouni et al., 2016; Fang et al., 2016).

We then developed the notion of denial, a defense mechanism. Defense mechanisms can be used more or less consciously to attenuate internal and external tensions, such as anxiety (Chabrol, 2005). Several classifications of defense mechanisms exist. Denial is a notion that has mainly been studied in the psychoanalytical field via Freud, but other theoretical fields have also taken a closer look at this phenomenon (Goldbeck, 1997). Denial is used to consciously or unconsciously exclude a certain information from the attention of the person (Chabrol, 2005; Hackett et al., 1968; Rossi Ferrario et al., 2017). This defense can be more or less adaptive and different criteria need to be taken into account in order to decide on the adaptive character of denial (Chabrol, 2005; Cramer, 2015). Denial still remains an unclear and rather unprecise phenomenon in literature today, due to the many different definitions that have been given of this phenomenon. In this thesis, we mainly base ourselves on the definition of Hackett and colleagues (1974, p.94), which we have

defined earlier (cf. *Chapter 2 – A precision of terms*). Today, some even consider denial as being close to a coping mechanism, and not only being a defense.

Denial is a defense mechanism that has largely been studied among patients suffering from diseases such as CHD (Sirois, 1992). Denial can indeed be a defense or a coping style to help patients to face the anxiety and stress caused by the disease and its diagnosis. Several forms of denial exist when it comes to physical illness (Hackett & Cassem, 1974; Goldbeck, 1997; Sirois, 1992). Denial of the illness, which we focus on in our thesis, can lead to serious consequences (Janne et al., 1990). Indeed, focusing on a psychosomatic approach, we noted that at short term, denial can have beneficial effects on the patient's physical and mental health when suffering from a CHD (Jadoulle, 2006). But at longer term, denial can have negative consequences, reducing adherence to necessarily treatments of CHD. Different tools have been developed to assess denial in coronary diseases, but many critics have been given to those methods, partially due to the ambiguity of the term (Goldbeck, 1997; Sirois, 1992). We have described some of those existing tools, like the Hackett & Cassem Denial Rating Scale (1974) and the IDQ (Rossi Ferrario et al., 2017) which we decided to use in our thesis as it is recent and takes the main critics given to measures of denial into account.

Finally, we took a closer look at why some patients deny more than others, in order to define criteria leading a CHD patient to use denial more easily. This has been less studied in most of the literature focusing on denial among CHD patients. Sociodemographic factors, such as younger age, male gender, living with someone, have been established by the study of Fang and his colleagues in 2016. As pointed by the authors, some of these characteristics are also typical of patients who delay their arrival at hospital when suffering from CHD-related symptoms. It seems that some social determinants or factors of personality have less been studied (Wigger, 2011) but could play an interesting role in developing denial, like personality (Denollet, 2000).

Two major elements which have been the focus of this thesis are the event that the MI represents, and the interpersonal context, as they could also explain why some patients use denial more than others. MI is an unexpected and traumatic event, that faces people with their mortality and often leads to intense distress or depression (Fields, 1989; Jacquet-Smailovic et al., 2020; Whitehead et al., 2006; von Känel et al.,

2011). Many studies have shown that patients often use denial as a way to cope with fear caused by MI (Albarqouni et al., 2016; Covino et al., 2011; Fang et al., 2016; Fields, 1989). The second element that has been developed in this theoretical section concerns the interpersonal context of the patient. Denial could indeed have a finality beyond and above the patient alone (Janne, 1988), and protect not only the patient but also close persons to the patient (Goldbeck, 1997). Several studies were described, highlighting the importance of this significant other in the process of diagnosis and treatment of CHD. For example, displacement is a frequent phenomenon observed among CHD patients (Janne et al., 1988). Also, in Brogniez's thesis (1998), it was found among patients hospitalized in palliative care that the more the family seemed anxious, the more the patient seemed to deny his illness. This shows the importance to take the patient's entourage into account in order to understand how denial is established.

By this review of literature, we were able to note how complex the notion of denial is, the way it affects the patient and its health, and the factors that could play a role into developing it. We will now present our empirical research and analyze our results based on the studies we have described earlier.

EMPIRICAL SECTION

Introduction to the empirical section

Based on the review of literature we have presented in the chapters 1 to 4, as well as the hypotheses mentioned in the introduction of this thesis, we have created a questionnaire in order to evaluate the presence of denial among patients suffering from CHD, as a function of two main determining factors: the acute event that MI represents, and the interpersonal context of the patient. Having a clearer picture of the elements that can influence the presence of denial among patients suffering from CHD could have interesting implications, as it would help medical staff in the clinical management of this defense mechanism. For psychologists more precisely, the results of this study could influence the development of interventions in order to target denial, depending on the two investigated factors. In the next chapters, we will first expose the methodology we have used to create our study, and will also mention the procedure and used research instrument. Information about the selected sample as well as our hypotheses will be given. Subsequently, results of the study will be analyzed and discussed. Limitations and future perspectives will be provided.

Chapter 1 : Methodology, instrument and sampling

1. Procedure

In order to collect the relevant data and based on our hypotheses (*infra*), two groups of patients were targeted: acute and chronic patients, as long as they had a coronary heart disease. First, “acute” (hospitalized) patients in the cardiology and cardiac surgery units of the CHU UCL Namur (Godinne site) were invited to participate in the study being the subject of this thesis. Those patients were directly met in their hospital ward following their medical intervention (e.g. coronarography). Objectives of the study were explained to them. If they agreed to, the questionnaire was left in their room so that patients could have time to complete it. Informed consent had to be signed before completing the questionnaire, which was re-taken by the Master student at the end of the day. Second, “chronic patients” were also approached by different means: when they came to the CHU for a follow-up consultation to their

cardiologist, or when they went to their weekly heart rehabilitation session (with physiotherapist). In both cases, the main objectives of the study were explained to them and their informed consent was asked before completing the questionnaire. This gave us the possibility to order and select patients afterwards depending on their disease and on the interventions they had undergone (the main inclusion criteria was to suffer from a CHD). By having access to Omnipro (informatized medical files of the patients), we had the possibility to study the possible effect of the MI and of the patient's entourage on the presence of denial. Agreement of the head of the cardiology department of the CHU Namur (Antoine Guedes), the chief of clinic of cardiology (Laurence Gabriel) as well as the ethics committee of the Godinne site were obtained (cf. *appendix – agreement of the Ethics Committee*). The data collection debuted in October 2021 and ended in December 2021. This period corresponded to the second wave of the Covid-19 pandemic, resulting in a reduced number of hospitalized patients and patients who came to their follow-up consultation.

2. Description of the sample

In total, 75 patients responded to the survey¹ (cf. *appendix - descriptive statistics – tables 1 to 4 and graphs 1 to 13*). Nine patients were excluded as they did not meet the main inclusion criteria, namely suffering from a coronary heart disease. The sample was mainly constituted of men (81.8%) and the mean age was 66.5 years old (± 9.31). Regarding nationalities, 55 patients were Belgian, six were French, two patients were Italian and one was Polish. With respect to marital status, the majority of the patients was in a relationship (77.3%) at the time they completed the survey. Also on average, 7,96 (± 9.86) years had gone by since the patient first experienced issues regarding his coronary disease. Among the patients, and at the time of the completion of the survey, 56.1% of the sample had already experienced at least 1 MI (25.8% had not) and 37.9% had already experienced a heart surgery (43.9% had not). For 18.2% of the sample (12 patients), we could not have access to medical information. In our sample, the average global score of denial (the sum of the IDQ subscales *denial of negative emotions* and *resistance to change*) was of 34.98 (\pm

¹ It is to note that, for each variable investigated, missing values exist and had to be taken into account for descriptive and statistical analysis.

11.39), knowing that maximum score obtained was 60. Regarding conscious avoidance, the third subscale of the IDQ, patients scored on average 9.47 with a standard deviation of 5.50 (maximum score being 20). The average score of perceived anxiety of the significant other was of 34.18 (\pm 13.65), with a maximum score of 66.5. At last, the average score of perceived presence of the significant other was of 20.56 (\pm 8.72), with a maximum score of 30, but this last variable had to be excluded due to various issues associated to the measure².

3. Research instrument

1. Introduction

To collect the relevant information, a paper questionnaire was created in collaboration with Professor Pascal Janne. The questionnaire consisted of 24 items and was principally composed of visual analogical scales from 1 to 10 pertaining to denial and presence as well as perceived anxiety of the patient's closest relative. Based on comments made by Professor Maximilien Gourdin, some items were modified in order to obtain the final result (cf. *appendix - survey of the study*). An introduction to the questionnaire explains the main objectives of our study, the person to contact in order to respond to eventual questions, and asks informed consent.

2. Sociodemographic information

The first series of items concerns personal questions about the patient (items 1 to 5). Those include questions about the patient's gender, nationality, age, civic status (who is the patient's closest relative, or person, helping him to face his/her disease) and presence of children. Information pertaining to the patient's disease and medical interventions were immediately collected via patient's medical records, when they had agreed to give their name on the survey (presence of MI or not, presence of cardiac surgery or not, number of years since first coronary problems emerged).

² Several patients did not respond to these items as they seemed less relevant for patients who were not hospitalized and lived with their significant other. Equally, due to the Covid-19 pandemic, restrictions were imposed to the visits of relatives to hospitalized patients, making our items irrelevant for them.

3. Measure of denial

The second set of items (items 6 to 14) evaluates the presence of denial. The selected items are extracted from the Illness Denial Questionnaire [IDQ], developed by Rossi Ferrario and colleagues (2017). This recent questionnaire "... assesses patient's (as well as caregivers') denial in relation to their illness/disturbance" (Rossi Ferrario et al., 2017, p.909). Originally, this questionnaire assesses denial independently of the specific kind of illness involved. It is a self-report questionnaire that consists of 24 dichotomous items. The IDQ is based on a three-factor structure, as it assesses three dimensions: "Denial of negative emotions", "Resistance to change" and "Conscious avoidance" (for a larger definition of each dimension, cf. Rossi Ferrario et al., 2017). Together, the two first dimensions represent the core components of denial (Rossi Ferrario et al., 2017; Rossi Ferrario, Panzeri, Anselmi & Vidotto, 2019), and the third one is an independent component relative to the behavior of the illness denial. According to Confirmatory Factor Analysis, internal consistency indices and test-retest analysis, the IDQ presents a meaningful three-factor structure (Cronbach's α : 0.87–0.96). The IDQ also has a good concurrent validity (denial being negatively associated to anxiety and depression) as well as stability (r from 0.71 to 0.87).

In our survey, internal consistency measures were also taken. We calculated the Cronbach's α separately for the Denial and the Conscious Avoidance scales like proposed in Rossi Ferrario and colleagues' 2017 article. Those can be found in the appendix (cf. *appendix - descriptive statistics – table 3*). The Cronbach's α for the global score of Denial (including measures of "Denial of Negative Emotions" and "Resistance to change") was of 0.8. The Cronbach's α for the subscale "Conscious avoidance" was less satisfactory as only a score of .49 was obtained. This is probably due to the fact that this scale only included 3 in our questionnaire.

Indeed, in order to keep our questionnaire as short as possible, as we know that CHD patients have a tendency to be impatient (e.g. Mendes de Leon, 1992) and being sure as much patients as possible would agree to participate, a selection of some items of the IDQ was made. We selected 9 items out of the 24 original items. Three items with the highest factor loadings per dimension were chosen. We have also decided not

to use a dichotomous version of the items, but to convert them into visual analogical scales, in order to have a higher variety in responses and obtain continuous scores. Finally, as no French and validated version of the questionnaire exists, we translated the English-version of the IDQ (Rossi Ferrario et al., 2017) into French using the back-translation method (Triandis, 1980). The author of the questionnaire was contacted in order to obtain her agreement on this translation and use of the questionnaire.

Several reasons led us to select the IDQ to assess denial. This questionnaire is one of the most recent that exists to evaluate denial. As told before (cf. *chapter 3, point 5 of this thesis*), many critics and limits have been found to the existing questionnaires evaluating denial, such as the one of Hackett & Cassem (1974). The IDQ takes these limitations into account. The IDQ also relies on a clear definition and theoretical structure of denial. Although we mainly want to focus on the two dimensions that constitute denial, assessing their relationships to “Conscious Avoidance” will also be interesting as it is a possible illness denial behavior for CHD patients.

4. Measure of presence and perceived anxiety of the significant other

The third (and last) set of items (items 15 to 24) evaluates the interpersonal context of the patient. The patient is asked to think about the person that has been the most present during the hospitalization or to help facing the disease in general. We postulate that it is most often the patient’s life companion, but it might also be a parent, a brother or sister, or a friend. This is most often the person to whom the medical staff addresses itself, other than the patient. The items evaluate two elements: whether this person (the “significant other”) has a tendency to be very present (during the hospitalization or in a more general way, like at home; but as said earlier, this variable was left behind in statistical analyses), and whether the patient perceives this person as being anxious, stressed out, and protective towards the patient. Those items have been created by ourselves and have been reviewed by Professor Maximilien Gourdin and Professor Pascal Janne.

Regarding internal consistency, a Cronbach’s α score was calculated on the items measuring perceived anxiety of the significant other. As can be seen in the

appendix (cf. *appendix - descriptive statistics – table 3*), Cronbach’s α was of 0.72 in our sample.

4. Hypotheses

Regarding hypotheses, our objective in this study is to limit them to only a few. Above all, our study raises a series of questions about determinant factors of the presence of denial among CHD patients. We want to stay as parsimonious as possible and focus majorly on our two selected elements next to sociodemographic variables: the event of MI and the interpersonal context of the patient. We also aim at being realistic: as our studied population is particular (patients, some of them being hospitalized), and our study is monocentric and has been realized in a short period of time *and* during the Covid-19 pandemic, we anticipated that our number of participants would be limited, and therefore preferred to limit the formulation of hypotheses in the context of this study to two main questions and hypotheses.

1. Characteristics of deniers

First of all, based on our review of literature and more precisely on the second point of our fourth chapter (“*Characteristics of the denying patient*”), we have formulated some hypotheses regarding the presence of denial depending on some sociodemographic aspects, that are listed below. We essentially based those hypotheses on the study of Fang and colleagues (2016) “*Is denial a maladaptive coping mechanism which prolongs pre-hospital delay in patients with ST-segment elevation MI?*”, as it is one of the few studies that has investigated sociodemographic characteristics of a “typical” denier having a CHD.

H1a : Male patients are more likely to deny than female patients.

H1b : Younger patients are more likely to deny than older patients.

H1c : Patients who are currently in a relationship are more likely to deny than patients who live alone.

H1d : The medical history (number of years that passed by since the patient first experienced coronary- related health problems) has no influence on scores of denial.

H1e : Patients who have one or more children to care for are more likely to deny than patients who don't have children.

Regarding H1d, in their study, Fang and colleagues (2016) did not find an effect of medical history (they assessed severity of the MI by taking into account length of stay in intensive care, incidence of the cardiac arrest, complications) on the outcome of denial. However, as we stated in the theoretical part of this thesis (cf. *chapter 3 – time differential effects*), denial can be used both at short and long term and will have different effects. When a diagnosis is given, at short term, of a CHD, denial indeed is an emergency mechanism to ward off stress. But at long term, it is a sign of the non-integration of the disease (Sirois, 1992). We also know that denial should be assessed longitudinally (in long-term) as it can change throughout time (Sirois, 1992), but few studies have really done so (Froese et al., 1974; Aitken-Swan, 1959, Spiess et al., 1994; as cited in Goldbeck, 1997). Most of the studies have looked at short and long term consequences of denial, pointing to the fact that denial can be beneficial at short term but maladaptive at long term, but few to no studies to the best of our knowledge have investigated whether denial is *more present* in short term or long term (in other words, no studies have investigated whether the medical history of the patient influence the presence of denial). From what we have read, we think that denial can be present both at the beginning of the medical path of the patient (when diagnosis is made) as well as later, and can even be present after years of medical treatment for the disease in question. Therefore, in the same vein as Fang's and colleagues' study (2016), we postulate no effect of the number of years that have passed since the development of coronary-related health problems on denial.

H1e is not based on a result found in Fang and his colleagues' study, as it has not been investigated by it. However, we still find it interesting to study whether the presence of children could have an impact on the presence of denial among patients. We postulate that the patient could deny in order to protect his relatives (protective interpersonal function) and not to worry his family (and spouse). For men more

precisely, denying could help the patient to maintain his status of “*bon père de famille*”, in a society that often still requires to “stay strong”. Here again, we accentuate the finality, the utility that denial could have for the patient. Denial could partially be iatrogenic, and not the sole fact of the patient (Janne et al., 1990).

2. Hypotheses regarding determinants of denial

H2 : The frequency of denial will be higher among patients having suffered a MI.

Regarding more theoretical questions on the determinant factors of denial among coronary patients, our **first question** is the next one : *Is the frequency of denial modulated by the presence of the acute event that the MI represents?* Several studies found that patients having suffered from a MI are at risk of denying, as MI represents a traumatic, acute event facing people with their mortality. Our first objective, therefore, is to corroborate (or not) this result.

H3 : The more the patient perceives his/her significant other as being anxious and distressed, the more likely he/she is to deny.

Our **second question** is this one: *Is the frequency of denial modulated by the presence and anxiety of a significant other ?* Although many studies have focused on the way couples cope when faced with a MI and even sometimes hide their concerns from their spouses (e.g. Coyne et Smith., 1991; Suls, Green, Rose, Lounsbury & Gordon, 1997), less studies have investigated how denial could be modulated by the presence of a significant other whose tendency is to be anxious. Several articles and publications mention the need to take into account the patient’s interpersonal context in order to understand the presence of denial (e.g. Goldbeck, 1997; Janne et al., 1990), but few to none existing scientific articles have studied this specific matter in the case of denial among CHD patients. We aim at taking a closer look at the phenomenon of denial in particular in relationship to the patient’s entourage.

3. Exploratory hypothesis regarding the subscales of IDQ

H4 : Denial of negative emotions and resistance to change are positively associated, whereas both dimensions are not associated to conscious avoidance.

Although we are mainly interested in seeing possible determinants of denial, it is important to remember that the used questionnaire, the IDQ (Rossi Ferrario et al., 2017) evaluates denial as being constituted of three subscales: denial of negative emotions, resistance to change and conscious avoidance. The two first subscales combined form denial, whereas the third subscale is an independent component. As it has been studied by the authors, we want to see whether, in our sample, the same three-factor structure is found, by analyzing the correlations between the three dimensions.

Chapter 2 : Analysis of the results

1. **Introduction**

In this chapter, the results obtained on the different measures evaluated through the survey will be analyzed and discussed. To do so, IBM SPSS Statistic 25 was used. To answer to all the previous mentioned hypotheses, sociodemographic measures, measures of denial and presence and perceived anxiety of the significant other were analyzed. Some medical information of the patient were also taken into account. The tests that were realized included descriptive analyzes (frequencies and case summaries), tests of normality (Kolmogorov–Smirnov and Shapiro–Wilk tests), and homogeneity of variance (Levene test), comparisons of means (t-test on independent samples, Mann-Whitney) and correlations (Pearson, Spearman). As our sample responded to conditions of normality, parametric tests were mostly privileged. Main analyses are described in the appendix (*cf. appendix - Inferential statistics and data analysis – tables 1 to 7*).

2. **Sociodemographic hypotheses**

H1a : Male patients are more likely to deny than female patients.

The mean score of denial among males (N = 54) is of 35.87 (\pm 11.07), while the mean score of denial among females (N = 11) is of 31.04 (\pm 13.03) (cf. *descriptive statistics – graph 7*). Maximum scores of denial were lower for females (44.10) than for males (60.00). An independent-samples t-test was conducted to compare scores of denial among males and females. According to the independent-samples t-test, there was no significant difference between the mean scores of global denial when comparing males to females; $t(63) = 1.281, p = .205$. As this was surprising to us, we also conducted a Mann-Whitney test to compare results (by recoding gender into 0 and 1). The Mann-Whitney test also indicated that there is no significant difference between the mean scores of global denial when comparing males (Mdn³ = 34.65) to females (Mdn = 33.3); $U = 235.5, p = .282$. Based on our sample, and by admitting a risk error of 5%, we cannot affirm that males suffering from a CHD deny on average more than females do (cf. *inferential statistics – tables 1a and 1b*), and therefore reject H1a.

H1b : Younger patients are more likely to deny than older patients.

A Spearman's correlation coefficient was computed in order to assess the relationship between the patient's age and the patient's score of denial. There was no significant correlation between the two variables, $r_s = 0.023, n = 65, p = .857$. A scatterplot summarizes the results (cf. *descriptive statistics – graph 12*). Based on our sample, and by admitting a risk error of 5%, we cannot affirm that a young age is positively associated with more denial among patients suffering from a CHD (cf. *inferential statistics – table 2*), and therefore reject H1b.

H1c : Patients who are currently in a relationship are more likely to deny than patients who live alone.

Global scores of denial were compared among patients who currently are and are not in a relationship (single). The mean score of denial among patients in a relationship (N = 51) is of 35.75 (\pm 11.30), while the mean score of denial among single patients (N = 13) is of 31.14 (\pm 11.40) (cf. *descriptive statistics – graph 8*).

³ Mdn = Median

Maximum scores of denial were lower for single patients (48.40) than for patients in a relationship (60.00). An independent-samples t-test was conducted to compare scores of denial among those two groups of patients. According to this test, there was no significant difference between the mean scores of global denial when comparing single patients to patients in a relationship; $t(62) = -1.313$, $p = .194$. A Mann-Whitney test also indicated that there was no significant difference between the mean scores of global denial when comparing single patients (Mdn = 29.30) to patients in a relationship (Mdn = 35.5); $U = 245$, $p = .149$. Based on our sample, and by admitting a risk error of 5%, we cannot affirm that patients who are currently in a relationship and suffering from a CHD deny on average more than patients who have the same disease but who are single (cf. *inferential statistics – tables 3a and 3b*), and therefore reject H1c.

H1d : The medical history (number of years that passed by since the patient first experienced coronary-related health problems) has no influence on scores of denial.

We compared mean scores of denial depending on the medical history of the patient. To do so, the patients were distributed in two groups: the ones who have a “recent” medical history, meaning their first coronary-related health problems occurred in the last year (e.g. first coronarography, medical consultation, MI,...) and the ones who have a more “ancient” medical history, meaning that more than 1 year has passed by since their first coronary-related health problems. Indeed, we looked at the patient’s medical files (when authorized) and looked-up when the patients went to the hospital for the first time with regard to coronary heart-related health issues. 12 patients did not provide access to their medical information and were therefore excluded from this analysis.

The mean score of denial among patients with an ancient medical history ($N = 26$) is of 32.59 (± 10.28), while the mean score of denial among patients with a recent medical history ($N = 28$) is of 36.56 (± 12.56) (cf. *descriptive statistics – graph 9*). Maximum scores of denial were lower for patients with an ancient medical history (50.40) than for patients with a more recent medical history (56.30). An independent-samples t-test was conducted to compare scores of denial among those two groups of patients. According to this test, there was no significant difference between the mean

scores of global denial when comparing their medical history; $t(52) = -1.271, p = .210$. A Mann-Whitney test also indicated that there was no significant difference between the mean scores of global denial when comparing patients with an ancient medical history (Mdn = 32.80) to patients with a recent medical history (Mdn = 37.00); $U = 292, p = .213$. Based on our sample, and by admitting a risk error of 5%, we cannot affirm that there is a difference among CHD patients when it comes to their denial score and when comparing the length of their medical history (coronary health-related problems) (cf. *inferential statistics – table 4a and 4b*), which confirms H1d.

H1e : Patients who have one or more children to care for are more likely to deny than patients who don't have children.

One of the objectives of this thesis was to assess the patient's interpersonal context to understand his use of denial. We postulate that patients who have more children to care for are more likely to deny. To test this hypothesis, we have compared scores of denials depending on the number of children the patient has to care for. Even though the results of this analysis will be presented here, those have to be nuanced as some issues have been identified with regard to the measure of number of children. Indeed, some patients understood they had to give the number of children they had, whereas others had understood the number of children whom they still cared for (lived under their roof). Descriptive statistics provide us with interesting results, showing that the mean of the score of denial varies depending on the number of children. It is the lowest for patients having 1 children to care for ($M = 25.70 \pm 14.83$) and the highest for patients having 0 children to care for ($M = 36.90 \pm 11.25$) (cf. *descriptive statistics – graph 10*). Regarding inferential statistics, as only a small number participants belongs to each category "number of children", non-parametric tests were privileged. A Kruskal-Wallis test was conducted to compare mean scores of denial depending on the number of children patients said they had or cared for. This test showed that there was no significant difference between mean scores of global denial when comparing patients according to their number of children; $H(4) = 5.12, p = .275$. Based on our sample, and by admitting a risk error of 5%, we cannot affirm that there is a difference among CHD patients when it comes to their denial score when comparing the number of children they have or care for (cf. *inferential statistics – table*), and therefore reject H1e.

3. Hypotheses regarding determinants of denial

H2 : The frequency of denial will be higher among patients having suffered a MI.

We compared mean scores of denial depending on the presence of a MI. To do so, the patients were distributed in two groups: the ones having suffered from at least one MI and the ones having never suffered from a MI. Again, 12 patients did not provide access to their medical information and were therefore excluded from this analysis. The mean score of denial among patients having suffered from at least one MI (N = 37) is of 33.83 (± 12.25), while the mean score of denial among patients having never suffered from a MI (N = 17) is of 36.45 (± 10.10) (cf. *descriptive statistics – graph 11*). Maximum scores of denial were lower for the latter (53.60) than for the upper (60.00). An independent-samples t-test was conducted to compare scores of denial among those two groups. According to this test, there was no significant difference between the mean scores of global denial when comparing patients who had or had not suffered from a MI; $t(52) = -.767$, $p = .446$. A Mann-Whitney test also indicated that there was no significant difference between the mean scores of global denial when comparing patients who had suffered from at least one MI (Mdn = 33.40) to patients who had never suffered from a MI (Mdn = 37.00); $U = 277.5$, $p = .491$. Based on our sample, and by admitting a risk error of 5%, we cannot affirm that patients who have suffered from one or more MI are at higher risk of denying than patients who have never suffered from a MI (cf. *inferential statistics – table 6*), and therefore reject H2.

H3 : The more the patient perceives his/her significant other as being anxious and distressed, the more likely he/she is to deny.

A Spearman's correlation coefficient was computed to assess the relationship between the patient's score of denial and the patient's perception of the anxiety of his/her significant other. A significant correlation was found between the two variables, $r_s = -.242$, $n = 66$, $p = .05$. A scatterplot summarizes the results (cf. *descriptive statistics – graph 13*). This direction of effect was not what was expected by our hypothesis. Indeed, the correlation found shows that, based on our sample, and by admitting a risk error of 5%, we can admit that a CHD patient's score of denial is

negatively associated with his perception of the anxiety of his/her significant other. This means that, in our sample, the more the patient perceives that his/her significant other is anxious and distressed by the situation, the less he will be inclined to deny (cf. *inferential statistics – table 7*).

4. **Exploratory hypothesis regarding the subscales of IDQ**

H4 : Denial of negative emotions and resistance to change are positively associated, whereas both dimensions are not associated to conscious avoidance.

In Rossi Ferrario and colleagues' 2017 article "*Illness denial questionnaire for patients and caregivers*", when focusing on patient's responses, denial of negative emotions and resistance to change were positively associated ($r = .92$), correlations between denial of negative emotions and conscious avoidance (an independent component) were low ($r = -.17$) and resistance to change and conscious avoidance were clearly independent, with a correlation of $.01$. As postulated by the authors, "... these results confirm the three-factor structure of the IDQ" (Rossi Ferrario et al., 2017; p. 913). To see whether the same patterns of correlations are found between the different subscales of the IDQ in our sample, we have computed Spearman's correlation coefficients⁴ between the subscales denial of negative emotions – resistance to change – conscious avoidance. A strong positive correlation was found among our sample between denial of negative emotions and resistance to change, $r_s = .577$, $p = .000$. No significant correlation was found between the subscales denial of negative emotions and conscious avoidance, $r_s = -.112$, $p = .372$; or between the subscales of resistance to change and conscious avoidance, $r_s = -.182$, $p = .143$. This means that, in our sample, the same three factor structure of the IDQ has been found, showing that negative emotions and resistance to change are somehow related and that conscious avoidance is indeed an independent component of the IDQ (cf. *inferential statistics – table 8*). H4 is admitted.

⁴ Spearman's correlations were privileged as all three subscales of the IDQ were not normally distributed.

Chapter 3 : Discussion of the results

1. Introduction

The main objective of this thesis was to investigate different sociodemographic, medical and interpersonal variables that could have an influence on the level of denial among patients suffering from coronary heart diseases (a psychological defense mechanism often used). First of all, we have tried to establish which sociodemographic factors, such as the patient's gender or age, could characterize denying CHD patients, as this has not much been studied in current literature (Fang et al., 2016). Secondly, we wanted to see whether medical variables such as the patient's medical history or more importantly the presence of MI could influence the presence of denial. Third, we tried to establish whether the patient's interpersonal context could be linked to the level of denial of the CHD patient. In order to interpret this thesis' results, we will now compare them to the studies we have evoked in the theoretical part. Results of our study will be analyzed, interpreted and discussed. Afterwards, limitations of this thesis and of the executed study will be exposed, before proposing clinical implications and future empirical investigations.

2. Interpretation and discussion of the results

As has been shown in the previous part "Analysis of the results", it seems that few to none of our hypotheses have been confirmed by our data. However, the fact that denial seems relatively independent from most of the investigated variables, still provides us with interesting and innovating information. In a general matter, we think that it is important to note that, for all hypotheses *for which we did not find any significant result*, two possible explanations can be given: 1) First, it is possible that our sample size reduces statistical power and therefore makes it impossible to find a significant result and to show a relationship between denial and variables such as age, gender, MI, and so on. But sometimes, even though no significant effect is found, our descriptive statistics still provide us with contrasting information (with a tendency to confirm our hypotheses). We therefore think that other studies need to be done to understand the relationship between denial and those variables, with larger samples.

2) The second explanation would be that our study is quite innovative in that it shows that denial is relatively *independent* from most of the investigating variable, showing again how important it is to define denial more clearly (as a coping strategy *or* defense mechanism that is highly intrapersonal). The independency we have found between denial and most of the investigated variables could let us understand that it is truly hard to target a specific population that denies more and that denial varies from an individual to another, like the distribution of our scores of denial shows (in our sample, there is a high variability of denial in population). In the next paragraphs, we will evoke each hypothesis and interpret and discuss our results.

H1a : Male patients are more likely to deny than female patients.

It is interesting to note that a gender-gap exists in our sample, our majority of participants being men. This is quite representative of the general population of patients suffering from CHD, as more men than women suffer from it. As told by Weidner (2000), due to the combination of several factors (biological, behavioral, but also psychosocial), there is a gender gap in CHD's, with men being more at risk to suffer from CHD's than women.

Contrary to what is generally found in literature regarding denial in physical illness and more specifically CHD, our sample did not provide us with evidence that male patients are significantly more likely to deny than female patients ($p = .205$). Denial seems independent from gender. This result goes against what is generally found. In 2016, Fang and his colleagues were able to show that, among their 533 ST-elevated MI patients, deniers were more likely men ($p = .01$). Other studies that looked at denial in other diseases like lung cancer (e.g. Ketterer et al., 2004; Vos et al., 2010) found that men were at higher risk of denying. In those articles, different explanations were given to explain this gender-gap regarding denial, like the fact that men are less inclined to focus on health-related issues than women and could therefore deny in an easier matter than women (Pearlin et al., 1978; as cited in Vos et al., 2010), or that there is still a masculine view saying that being ill is being weak, leading to denial (Courtenay, 2000, O'Brien et al., 2005; as cited in Vos et al., 2010). However, we did not find any significative difference on scores of denial when comparing men and women, refuting previously found results.

It is still very important to look at our descriptive data in order to nuance this non significant result. Indeed, when looking at table 1 of our appendix *descriptive statistics*, we note that the mean of the global score of denial is higher for men (M = 35.86) than it is for women (M = 31.03). Moreover, maximal scores of denial were higher for men (Max = 60) than they were for women (Max = 44.10). These descriptive results go in the same direction as posited in our first hypothesis and with the theoretical framework developed in the previous paragraph. So, although we cannot generalize those results to the general population of CHD patients, in our sample, there seems to be a tendency for men to be more likely to deny than women, making it unlikely that gender has no relationship at all with denial. As told by Ketterer et al. (2004), women are more free-spoken compared to men when it comes to their emotions and emotional distress. Future research will be needed to confirm this tendency.

H1b : Younger patients are more likely to deny than older patients.

In our sample, the mean age was of 66,54 years old. This also corresponds to what is generally found in the literature regarding CHD patients. Indeed, it is people who are 65 years old or more who are more at risk to develop a CHD (National Institute on Aging, 2018). It is therefore more rare to find younger patients in our sample, our youngest being 46 years old.

In our sample of CHD patients, no significant relationship has been found between age and denial ($p = .881$). Denial seems independent from age. This again contrasts with the results of the study of Fang and colleagues who found that "... patients with higher levels of denial were more likely to be younger ($p=.03$)" (Fang et al., 2016, p.70). The authors do not explain why, according to them, this result was found. They only state that a younger age generally also contributes to early arrival to hospital (Ladwig et al., 2011). According to Ladwig and colleagues (2011), it is possible that older adults delay more because they often suffer from co-morbid diseases, and it is therefore less easy for them to discriminate typical symptoms of their conditions from warning symptoms. To contrast with Fang's and colleagues' results regarding age and denial, other authors point to the possibility that older patients deny more. Indeed, ".. in an effort to distance themselves from stereotypical

views of old age and their own aging experience, older adults may tend to deny health problems to order more easily present as exemplifying “healthy aging” (Tanner, 2003; as cited in Wyman, Shiovitz-Ezra & Bengel, 2018, p.200). We found that no relationship exists at all between age and denial. Future research will be needed in order to shed a light on the influence of age on denial and to possibly target populations at risk. These studies will show either that age is related to denial or, as in our study, that no link can be established between these two variables, and that denial among CHD patients and can be used as much by older than by younger patients.

H1c : Patients who are currently in a relationship are more likely to deny than patients who live alone.

In our sample, the majority (77.3%) of the patients was in a relationship at the time they completed the survey. But no significant difference on the scores of denial were found when comparing patients that were or that were not in a relationship ($p = .194$). This non-result, again, contrasts with the results of the study of Fang and colleagues in 2016, who showed that patients who lived with someone were more at risk to be high deniers ($p = .01$). In the theoretical part of this thesis, we outlined different results of studies to show how important it is to take into account the close persons to the patient in order to understand denial among CHD patients: we mentioned the fact that patients are often accompanied by a significant other, that denial could protect the patient’s entourage from anxious representations (Goldbeck, 1997; Janne, 1988; Janne et al., 1988; Sirois, 1992), that displacement and hyperprotection is often observed among CHD patients and their close ones (Janne, 1988), that it is often the close one that urges the patient to go to the doctor (Fields, 1989) and some studies in the domain of palliative care even found what we have posited in one of our hypotheses, i.e. that the more the family seemed anxious, the more the patient seemed to deny (Brogniez, 1998).

We were unable to statistically show that denial is indeed higher among patients living with someone, indicating that denial seems to also be independent of the patient’s interpersonal context (meaning that denial is really intrapersonal; by and for the patient). If we look at descriptive results, however, scores seem to go in the way we have stated our hypothesis or show at least a tendency, as the mean score of

denial is higher among patients who are in a relationship ($M = 35.75$) than patients who are not ($M = 31.13$). Future research should investigate this variable with larger samples to see if this tendency can be confirmed or not.

H1d : The medical history (number of years that passed by since the patient first experienced coronary-related health problems) has no influence on scores of denial.

Among patients who gave their agreement, we looked up at some medical data in order to take them into account into trying to understand denial among our sample of CHD patients. Less than a year had passed by for 28 patients since their first problems, and more than a year had passed by for 26 patients. Comparing scores of denial for patients with a recent and more ancient medical history (cf. *analysis of the results – sociodemographic hypotheses*), we were unable to find any statistical difference, stating again that denial is independent from this variable. As in Fang and colleagues' study (2016), even if they did not measure exactly the same information as we did (they looked at the severity of MI among the patients) no effect of the medical history was found on the levels of denial. Our result therefore corroborates previous findings of independency between medical history and denial. Descriptive results show a small difference of mean scores of denials (means are higher for patients with an ancient medical history), but this difference is insufficient to be statistically significant. Future research will need to see if this independency between denial and medical history can be confirmed on larger samples. Indeed, it is possible that denial can be used differently from patient to patient, and that some will only use it at early and acute stages of their disease, while others will keep on using it throughout their whole life, never totally integrating their disease. This question brings us back to the need to use longitudinal measures in order to measure denial several times, as it fluctuates through time (Sirois, 1992).

H1e : Patients who have one or more children to care for are more likely to deny than patients who don't have children.

A last sociodemographic variable we decided to investigate in this study is the number of children the patient has. Let us remember that some defaults were found regarding the measure of number of children (cf. *analysis of the results –*

sociodemographic hypotheses), and we therefore decide not to interpret or detail them. When comparing the number of children patients had in our sample, it does not have a significant influence on the scores of denial. As our study is, to our knowledge, the first one to investigate the effect of the presence on children on the level of denial, future research should investigate this pathway using correct measures. We believe in the possibility that patients could deny in a will to protect their relatives (protective interpersonal function; Janne et al., 1990). Research focusing on samples of a larger size and using better measures could either confirm our hypothesis, or either infirm it by showing that denial is totally independent of the presence of children, and remains, again, a highly intrapersonal phenomenon, like we can see from our results.

H2 : The frequency of denial will be higher among patients having suffered a MI.

One of the main variable we wanted to assess throughout this thesis in relationship to denial among CHD patients was the presence of a MI or MI. Among our sample and the patients who agreed to provide us with this information, 37 patients had already experienced at least one MI and 17 had never experienced one, proving how MI is frequent among CHD patients.

When comparing those two groups of patients in our sample, no significant difference on the scores of denial were found ($p = .446$). This surprising result is contradictory to many findings in current literature focusing on denial among CHD patients, stating that denial is an often used defense mechanism among patients having suffered from a MI, a traumatic event leading to high perceived distress (Albarqouni et al., 2016; Covino et al., 2011; Fang et al., 2016; Fields, 1989; Jacquet-Smailovic et al., 2020; von Känel et al., 2011). However, those studies and theoretical papers generally only focused on patients having suffered from a MI, saying that frequency of denial was high among those patients, but did not compare them to samples of CHD patients who had not suffered from a MI. Therefore, we find our result interesting and innovating as it shows no significant difference in the levels of denial of patients who did or did not suffer from a MI. If this non significant result is *not* due to the low statistical power (because small sample size) of our study, this means that denial is a defense mechanism that is used by CHD patients in general and is *not specific* to patients having suffered from a MI. We can say from our results that denial as a coping

strategy is used to face stress and anxiety provoked by the disease in itself (diagnosis, treatments, consequences, ...) and not solely when an acute event such as a MI happens. As explained in the theoretical part of our thesis (cf. *Chapter 3 – the behavior of a denying patient*), different forms of denial exist to cope with physical illnesses (Hackett & Cassem, 1974; Janne et al., 1990; Sirois, 1992). Our result point to the importance to take denial into account as a broad mechanism and the need to not only focus on denial among patients having suffered from a MI, but CHD patients in general, as the use of this mechanism can have serious consequences (cf. *Chapter 3 – consequences of denial*).

H3 : The more the patient perceives his/her significant other as being anxious and distressed, the more likely he/she is to deny.

A quite original contribution of our thesis is to study the influence of the interpersonal context on the presence of denial among CHD patients. Interestingly, as proven by tests of normality, the variable “*perceived anxiety of the significant other*” was normally distributed. More interestingly even, a statistically significant relationship was found between scores of denial and of perceived anxiety of the significant other, but not in the direction that was expected. Indeed, as has been found in the literature, we expected that a higher perceived anxiety of the significant other would lead, in an effort of protection, to higher scores of denial for the patient. For example, Brogniez (1998) found that the more the family seemed anxious, the more the cancer patient seemed to deny his illness at three times of evaluation (anxiety - denial, time 1 : $r = .3920$, $p < .004$; anxiety – denial, time 2 : $r = .5373$, $p < .0001$; anxiety – denial, time 3: $r = .5773$, $p < .0001$). But our results do not go in them same direction as what is found in the literature, as a *negative* relationship was found between scores of denial and perceived anxiety ($r = -.245$, $p < .047$). This result is quite unique and complex to understand. First, it provides us with evidence, like we had stated, of the importance and need to assess the patient’s interpersonal context when one evaluates the way a patient copes with his/her disease. Taking the patient’s entourage into account, as well as the way in which they deal with the patient’s disease, is of the essence⁵. Secondly, it tells us that the *more* the patient perceives that his/her

⁵ This contrasts with all other results that systematically proved how independent denial seemed from most of the investigated variables, including the fact to be in a relationship or not.

significant other is anxious and distressed by the situation, the *less* he will be inclined to deny. Our idea, and what has often been proposed in literature regarding denial and CHD patients (e.g. Janne, 1988; Goldbeck, 1997; Sirois, 1992), that denial could serve an interpersonal function by protecting the patient's entourage from anxiety caused by the disease, has not been evidenced in this study, as another (surprising) direction of effect was observed. As we have only assessed relationships here, we cannot say whether a causal relationship exists between the two variables. Indeed, we cannot state whether perceived anxiety causes less denial in the chief of the patient, or whether the less the patient denies, the more it provokes anxiety among the patient's entourage as perceived by the patient. Future research, using adequate statistical models, will have to test this possibility.

H4 : Denial of negative emotions and resistance to change are positively associated, whereas both dimensions are not associated to conscious avoidance.

Finally, we wanted to see, through the use of the IDQ, whether the results obtained in our sample corroborated what had been obtained in the original article when it comes to the relationship between the three subscales of the IDQ (Rossi Ferrario et al, 2017). Indeed, as authors found, we obtained a positive relationship between denial of negative emotions and resistance to change ($p < .00$), and no association between those two subscales and the third one, conscious avoidance⁶ (respectively $p = .372$ and $p = .143$). These results confirm the three-factor structure of the IDQ (although we selected a restricted amount of items). As posited by the original authors (Rossi Ferrario et al., 2017, p.909) "Denial of negative emotions and resistance to change seem to contribute to a real expression of denial, and conscious avoidance seems to constitute a further step in the process of cognitive-affective elaboration of the illness". It would be interesting for future research to study each subscale's relationship to the variables assessed in this thesis in order to precise how denial of negative emotions, resistance to change, and conscious avoidance are, or are not, influenced by them.

⁶ We decided not to evaluate associations between conscious avoidance and the other assessed variables in our survey, but to focus on denial. However, future studies could study these relationships as conscious avoidance is a behavior that stems from denial.

3. A proposition of case study

We would like to nuance the results we have just interpreted with a case study based on the master's student experience as an intern in the cardiology and cardiac surgery units of the CHU UCL Namur (Godinne site). This proposition of a specific case provides us with evidence that is consistent with our main hypothesis that denial, interpersonal context and MI could be linked. The case study is accessible in the appendix (cf. *Appendix – A case study*).

4. Limitations

Several limits can be pointed when it comes to this thesis and its related empirical investigation. First of all, methodological limitations must be highlighted. Our data collection occurred during the second wave of the Covid-19 pandemic, therefore limiting our number of participants. If more patients had responded to the study, our sample could have been more representative of the existing population we were interested in and results would have been more generalizable. Here, our sample is majorly constituted of men with a mean of age around 66 years old. Regarding the selection of our sample, pragmatic choices were made. Indeed, we both selected chronic and acute patients, with the aim to compare them in order to look for a potential effect of the MI. However, many other factors have to be taken into account and they were not in this study (length of stay in ICU, other cardiac interventions,...). In the same vein, psychological factors such as personality are known to have an influence on the behavior of patients, and they were not evaluated in our study. Also regarding our sample, patients had to be excluded as they did not meet the inclusion criteria (i.e. suffering from a CDH).

With regard to the used survey, some limits also need to be pointed. Few items were not properly formulated and led to confusion among patients, with a need to carefully interpret associated results (e.g. number of children “to care for” – cf. *analysis of the results* for further details on the errors associated with this measure). The items evaluating the presence of the significant other, who aimed at evaluating how present in day to day life and during hospitalization the significant other of the patient was, had to be excluded (cf. *footnote – sociodemographic information*). We

should have adapted our questionnaire depending on whether the patient was currently hospitalized or not so that patients would better understand some items, but did not do so. Measures of perceived anxiety and presence of the significant other did not rely on existing and validated measures (we invented them), and validity of those measures is therefore not ensured. As the survey mainly included self-reported measures, those were subject to social desirability biases. Finally, in order to limit the length of our survey, items evaluating denial were selected (only 3 per subscale of the original IDQ) and are therefore be less valid than the original measure of denial.

Theoretical limits also need to be acknowledged. First of all, we had to make a selection in the theoretical part of this thesis and were unable to present an exhaustive picture of the current literature when it comes for example to understanding the consequences of the use of denial among coronary patients. Our aim was to help the reader understand the main results that exist to this day on the subject we are focusing on and to understand our research question. In this study, we intended to look at possible medical and interpersonal predictors of the presence of denial among CHD patients. But by doing so, one could say that we did not properly consider denial as being an intrapersonal, individual defense mechanism (used by the individual for the individual), and confused defense mechanisms with coping mechanisms. Indeed, we postulated that denial could be used in order to protect the significant other, but by doing so, are we still truthful to the original definition of denial and of defense mechanisms ? Coping mechanisms among couples with one partner suffering from CHD have been extensively studied in current literature. It is important not to confuse both. Also, we wanted to target a limited amount of predictors to understand the use of denial, but we have to acknowledge that denial is a complex mechanism and that humans are complex as well. Many other factors need to be understood in order to predict presence of denial, such as personality.

Regarding statistical analysis, as can be seen in the results part, only few of them were significant. This is probably due to the restricted amount of participants to the study. We also decided to analyze variable by variable the possible effect of each of them on the presence of denial, but did not look at interactions (e.g. gender – MI). We could also have used regressions in order to look at how all those variable predict denial *when analyzed together*.

5. Perspectives

The results of our study confirm how important it is to take denial into account as a way to cope with the coronary heart disease. Indeed, in our sample, a high diversity and variety of scores of denial was observed, and scores of denial were normally distributed. Denial is a way in which many patients cope with their disease, but denial can have consequences on the patient's physical and mental health. This is why understanding and taking denial into account to accompany the CHD patient in the best way possible is of the essence for a clinical matter. Health professionals need to be aware of the existence of this phenomenon and of the way it can sometimes impact the patient's adherence to treatment and understanding of the disease. As we can see from our results, denial seems relatively independent from most of the variables investigated. Therefore, one has to stay vary cautious when trying to target specific populations who could be more inclined than others to deny. We indeed saw that denial, in our study, was independent from gender, age, number of children, medical history, being in a relationship or not, having suffered or not from a MI. Denial can be used differently and by various patients. However, it is necessary to pursue the investigation of the patient's entourage and anxiety as perceived by the patient.

Further research should try to replicate our findings by using bigger samples of patients and by using more adapted measures. Also, if significative relationships are found, it would be interesting to investigate the causality of these relationships, as this could have important implications for clinical practice (e.g. implementing specific interventions based on the patient's entourage). As we have found that most of the investigated variables were not related to denial, it would be interesting to focus on other variables we did not take into account such as personality factors, as we have stated it could have an influence on denial (e.g. type A or D personality).

GENERAL CONCLUSION

More and more, we are living in a time where people live older. This also means that people live longer with their chronic diseases, such as coronary heart diseases. Today, we are increasingly moving away from traditional medical models where physical health is the main focus and where the doctor is the main decision-maker, towards a more collaborative approach to health care and patient care. Healthcare professionals become more, but probably still not enough, aware of the need to understand and take into account the way patients and their entourage cope with their disease. It is essential to learn how patients deal with their disease, as it can have important influences on their integration and acceptance of the disease, of their adherence to medical treatments, but also on their physical and mental health and therefore on their mortality and quality of life.

Cardiovascular diseases, and their most frequent form, coronary heart diseases (diseases of the blood vessels supplying our heart), form one of the most frequent form of chronic disease of our world population. Each year, 17.9 million people die of CHDs (WHO, 2017). As we have stated in the theoretical part of this thesis, CHDs are potentially mortal, and this possibility will essentially provoke emotions such as fear, anxiety, depression or stress (NHLBI, n.d.-a). This is why, as humans, different coping strategies or defense mechanisms can be used to face those feelings. Those mechanisms are used more or less consciously. One of this defense mechanism is denial. Denial means not taking into account a threatening, uncomfortable or unwanted external reality (Jadoulle, 2006) and can be more or less adaptive, depending on several criteria, including the domain or context in which it is used. Different means to assess and define this defense mechanism across theoretical frameworks have been proposed, often contradictory with one another. Denial as a defense mechanism among patients suffering from CHDs has already been studied frequently. Indeed, many studies have assessed its use based on a psychosomatic approach. Those studies have shown that a denying patient can present various forms of behaviors (Goldbeck, 1997), like not accepting his/her diagnosis or appear oblivious to it, minimize the implications of the illness, delaying seeking medical advice, and so on. It is also frequent that CHD patients deny suffering from their disease, seeing it as an accident or not due to changeable or internal factors. Different authors have assessed how the use of denial

can influence both the physical and mental health of the patient. It seems from them that at short term, denial can be beneficial for the patient as it shields him/her from the anxiety and stress provoked by the diagnosis of the disease (and, stress can have detrimental effects on the patient's physical health). However, in longer term, studies have shown that denial can become maladaptive because it reduces the patient's adherence to treatments, even though those treatments are essential to improve patient's health. Few studies (like the one of Fang and colleagues in 2016) have established sociodemographic factors that could be typical of deniers, like being male, younger, living with someone. Personality factors have also been assessed when it comes to CHD patients. It also typically seems that denial is frequent among patients who have specifically suffered from a MI, an acute and traumatic event. Finally, different studies have shown how important it is to take the patient's entourage into account to understand how they cope with their disease, but our study is one of the few that specifically evaluates its impact on the presence of denial among CHD patients.

It is clear that if denier's characteristics were sharply defined, one could target patients that will need evaluation. But this aspect of the phenomenon of denial among CHD patients is not clear enough in current literature. This is why we have decided to understand not the consequences, but the characteristics of CHD patients who are more prone at denying. We have wanted, based on our theoretical review, to focus on different sociodemographic factors (age, gender, to be or not in a relationship, length of medical history, number of children), on the specific event of the MI, and on the influence of the patient's entourage.

Our study found unexpected results, often contrasting with what is said in today's literature. Indeed, results pointed to the fact that denial actually seems independent from most of the variables we have investigated, making it hard to target specific populations more at risk to deny. Denial seems not related to gender, even though it is frequently thought that men are more likely to deny as they are less free-spoken than women regarding their emotions. Denial is also not related to age, as younger but also older patients seem to deny as much. In our study, the fact to be in a relationship does not influence the frequency of denial, nor does the number of children the patient has or the fact that his history of heart-related problems is more or less long. It also seems from our study that patients who have suffered from a MI are

not more susceptible than patients who have never suffered from one to deny; questioning the general notion that denial is an “urgency mechanism” used to face the trauma of this event only. Finally, when it comes to the perception of the patient of the anxiety of his significant other, it seems that it does have an influence on the presence of denial, but not in the way that we could expect it: a significantly higher level of denial is observed among patients who perceive their significant other as being *less* anxious. This last interesting results points to the importance to take the patient’s entourage into account, corroborating previous findings who showed how the patient’s spouse, for example, can influence the patient and his recovery.

Even though our study shows that it is really difficult to target a specific CHD population that could be more at risk to deny than others, the limitations of our study need to be taken into account and to nuance our findings (e.g. the fact that our sample is really small, reducing the statistical power of this study, that our sample could have been selected in a more precise way, or that some of our measures are very reviewable). Still, our high variability both of scores of denial and perceived anxiety of the significant other point to the importance to take those phenomena into account when trying to understand how patients deal with their CHD. Future research should explore those characteristics among larger samples. Other variables, such as personality, should be evaluated with regard to their influence on this defense mechanism. Targeting more at risk patients could be very interesting to later try to develop clinical interventions with those populations, by helping them to face and progressively integrate their disease.

Bibliography

Adam, J. (2005). La Verleugnung: Introduction à la conception à se faire de l'acte analytique. *Champ lacanien*, 2(1), 257-264.

<https://doi.org/10.3917/chla.002.0257>

Albarqouni, L., von Eisenhart Rothe, A., Ronel, J., Meinertz, T., & Ladwig, KH. (2016). Frequency and covariates of fear of death during MI and its impact on prehospital delay: Findings from the multicentre MEDEA Study. *Clinical Research in Cardiology*, 105(2), 135–144. <https://doi.org/10.1007/s00392-015-0895-3>

American psychiatric association. (1994). *DSM-IV. Diagnostic and statistical manual of mental disorders (4th ed.)*. Washington DC: American Psychiatric Publishing.

American Psychological Association. (n.d.-a). *APA Dictionary of Psychology – denial*. Retrieved from <https://dictionary.apa.org/denial>

American Psychological Association. (n.d.-b). *APA Dictionary of Psychology – psychosomatic*. Retrieved from <https://dictionary.apa.org/psychosomatic>

American Heart Association. (2015). *Acute coronary syndrome*. Retrieved from <https://www.heart.org/en/health-topics/heart-attack/about-heart-attacks/acute-coronary-syndrome>

American Heart Association. (2016). *About heart attacks*. Retrieved from <https://www.heart.org/en/health-topics/heart-attack/about-heart-attacks>

American Heart Association. (2017). *Treatment of a heart attack*. Retrieved from <https://www.heart.org/en/health-topics/heart-attack/treatment-of-a-heart-attack>

- Bar-On, D. (1985). Different types of denial account for short and long term recovery of coronary patients. *The Israel journal of psychiatry and related sciences*, 22(3), 155–172. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/3833846/>
- Belgique en bonne santé. (2020). *Etat de santé – maladies non transmissibles - cardiopathie ischémique*. Retrieved from <https://www.belgiqueenbonnesante.be/fr/etat-de-sante/maladies-non-transmissibles/cardiopathie-ischemique>
- Betts, J.G., Young, K.A., Wise, J.A., Johnson, E., Poe, B., Kruse, D.H., Korol, O., Johnson, J.E., Womble, M., DeSaix, P. (2013). *Anatomy and physiology*. Houston, Texas: OpenStax College.
- Bowlby, J. (1997). *Attachment and Loss: Vol. 3. Loss, Sadness & Depression*. London: Hogarth Press.
- Breznitz, S. (1983). The seven kinds of denial. In S. Breznitz, (Eds). *The denial of stress* (pp. 257-296). New York: International University Press.
- Brognez, L. (1998). *Etude sur les stratégies d'adaptation des patients cancéreux et plus particulièrement, ceux atteints d'hémopathies* (Master's thesis). Université catholique de Louvain, Louvain-la-Neuve.
- Celano, C. M., Daunis, D. J., Lokko, H. N., Campbell, K. A., & Huffman, J. C. (2016). Anxiety Disorders and Cardiovascular Disease. *Current Psychiatry Reports*, 18(11), 101. <https://doi.org/10.1007/s11920-016-0739-5>
- Centers for Disease Control and Prevention. (2019). *Heart Disease - Coronary Artery Disease (CAD)*. Retrieved from https://www.cdc.gov/heartdisease/coronary_ad.htm
- Centers for Disease Control and Prevention. (2020). *Heart Disease - Heart Attack*. Retrieved from https://www.cdc.gov/heartdisease/heart_attack.htm

- Chabrol, H. (2005). Les mécanismes de défense. *Recherche en soins infirmiers*, 82(3), 31-42. <https://doi.org/10.3917/rsi.082.0031>
- Cramer, P. (2015). Understanding Defense Mechanisms. *Psychodynamic psychiatry*, 43(4), 523–552. <https://doi.org/10.1521/pdps.2015.43.4.523>
- Croog, S.H., Shapiro, D.S., Levine, S. (1971). Denial among male heart patients. *Psychosomatic Medicine*, 33(5), 385-397. <https://doi.org/10.1097/00006842-197109000-00001>
- Cohn, P. F., Fox, K. M., With the Assistance of, & Daly, C. (2003). Silent Myocardial Ischemia. *Circulation*, 108(10), 1263–1277. <https://doi.org/10.1161/01.CIR.0000088001.59265.EE>
- Cosci, F. (2012). Assessment of personality in psychosomatic medicine: current concepts. *Advances in psychosomatic medicine*, 32, 133–159. <https://doi.org/10.1159/000330014>
- Cousins, N. (1982). Denial. Are sharper definitions needed?. *JAMA*, 248(2), 210–212. doi:[10.1001/jama.248.2.210](https://doi.org/10.1001/jama.248.2.210)
- Covino, J. M., Stern, T. W., & Stern, T. A. (2011). Denial of cardiac illness: consequences and management. *The primary care companion for CNS disorders*, 13(5), PCC.11f01166. <https://doi.org/10.4088/PCC.11f01166>
- Coyne, J. C., & Smith, D. A. (1991). Couples coping with a MI: a contextual perspective on wives' distress. *Journal of personality and social psychology*, 61(3), 404–412. <https://doi.org/10.1037//0022-3514.61.3.404>
- Denollet, J., Sys, S. U., Stroobant, N., Rombouts, H., Gillebert, T. C., & Brutsaert, D. L. (1996). Personality as independent predictor of long-term mortality in patients with coronary heart disease. *Lancet (London, England)*, 347(8999), 417–421. [https://doi.org/10.1016/s0140-6736\(96\)90007-0](https://doi.org/10.1016/s0140-6736(96)90007-0)

- Denollet, J. (2000). Type D personality. A potential risk factor refined. *Journal of psychosomatic research*, 49(4), 255–266. [https://doi.org/10.1016/s0022-3999\(00\)00177-x](https://doi.org/10.1016/s0022-3999(00)00177-x)
- Fang, X., Albarqouni, L., von Eisenhart Rothe, A. F., Hoschar, S., Ronel, J., & Ladwig, K.-H. (2016). Is denial a maladaptive coping mechanism which prolongs pre-hospital delay in patients with ST-segment elevation MI? *Journal of Psychosomatic Research*, 91, 68–74. <https://doi.org/10.1016/j.jpsychores.2016.10.008>
- Fields, K.B. (1989). Myocardial Infarction and Denial. *Journal of Family Practice*, 28(2), 157-161.
- Folks, D.G., Freeman, A.M., Sokol, R.S., Thurstin, A.H. (1988). Denial: predictor of outcome following coronary bypass surgery. *International journal of psychiatry in medicine*, 18(1), 57–66. <https://doi.org/10.2190/8dc9-n2en-69qb-7gtn>
- Fowers, B. J. (1992). The cardiac denial of impact scale: a brief, self-report research measure. *Journal of psychosomatic research*, 36(5), 469–475. [https://doi.org/10.1016/0022-3999\(92\)90007-o](https://doi.org/10.1016/0022-3999(92)90007-o)
- Freud, S. (1923a). The ego and the id. In J. Strachey (Eds. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 12-66). London: Hogarth Press.
- Freud, S. (1923b). The infantile genital organization: an interpolation into the theory of sexuality. In A.Richards (Eds.), *On sexuality* (Vol 7., pp. 307-312). London: Penguin.
- Freud, S. (1924). The loss of reality in psychosis and neurosis. In A.Richards (Eds.), *On Psychopathology* (Vol 10., pp. 219-226). London: Penguin.

- Freud, S. (1925). Die Verneinung. In S.Freud (Eds.) *Résultats, idées, problèmes* (pp.135-139). Paris: Puf
- Freud, S. (1926). Inhibition, symptoms and anxiety. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 20, pp. 77-174). London: Hogarth Press.
- Freud, A. (1936). *The ego and the mechanisms of defense*. New York: International Universities Press.
- Friedman, M. & Rosenman, R.H. (1959). Association of specific overt behavior pattern with blood and cardiovascular findings. *Journal of the American Medical Association*, 169(12),1286-1296.
[10.1001/jama.1959.03000290012005](https://doi.org/10.1001/jama.1959.03000290012005)
- Froese, A., Hackett, T. P., Cassem, N. H., & Silverberg, E. L. (1974). Trajectories of anxiety and depression in denying and nondenying acute MI patients during hospitalization. *Journal of Psychosomatic Research*, 18(6), 413–420. [https://doi.org/10.1016/0022-3999\(74\)90032-4](https://doi.org/10.1016/0022-3999(74)90032-4)
- Gach, O., Davin, L., Lempereur, M., Marechal, P., Martinez, C., & Lancellotti, P. (2019). Coronarographie diagnostique [Diagnostic coronarography]. *Revue medicale de Liege*, 74(S1), S17–S21.
- Goldbeck, R. (1997). Denial in physical illness. *Journal of Psychosomatic Research*, 43(6), 575–593. [https://doi.org/10.1016/S0022-3999\(97\)00168-2](https://doi.org/10.1016/S0022-3999(97)00168-2)
- Gul, Z., & Makaryus, A. N. (2020). Silent Myocardial Ischemia. In *StatPearls*. Treasure Island, FL: StatPearls Publishing.
- Hackett, T. P., Cassem, N. H., & Wishnie, H. A. (1968). The Coronary-Care Unit: An Appraisal of Its Psychologic Hazards. *New England Journal of Medicine*, 279(25), 1365–1370. <https://doi.org/10.1056/NEJM196812192792504>.

Hackett, T. P. & Cassem, N. H. (1974). Development of a quantitative rating scale to assess denial. *Journal of psychosomatic research*, 18(2), 93–100.

[https://doi.org/10.1016/0022-3999\(74\)90072-5](https://doi.org/10.1016/0022-3999(74)90072-5)

Hackett, T. P. & Cassem, N. H. (Eds.). (1987). *Massachusetts General Hospital handbook of general hospital psychiatry* (2nd ed). Littleton, Massachusetts : PSG Publishing Co.

Heart and stroke. (n.d.-a). *Heart – Tests*. Retrieved from

<https://www.heartandstroke.ca/heart/tests>

Heart and stroke. (n.d.-b). *Heart – Treatments*. Retrieved from

<https://www.heartandstroke.ca/heart/treatments>

Heart and stroke. (n.d.-c). *Heart – Emotions and feelings*. Retrieved from

<https://www.heartandstroke.ca/heart/recovery-and-support/emotions-and-feelings>

Jacquet-Smailovic, M., Tarquinio, C., & Houppe, J.-P. (2020). Traumatismes psychiques, trouble de stress posttraumatique et syndrome coronarien aigu: Une synthèse des données de la littérature. *European Journal of Trauma & Dissociation*, 4(2), 100123. <https://doi.org/10.1016/j.ejtd.2019.100123>

Jadoulle, V. (2006). Le déni comme angle d’approche psychosomatique en cardiologie et en oncologie. *Annales Médico-psychologiques, revue psychiatrique*, 164(2), 108–114. <https://doi.org/10.1016/j.amp.2004.06.017>

Jamner, L. D., & Schwartz, G. E. (1986). Self-deception predicts self-report and endurance of pain. *Psychosomatic medicine*, 48(3-4), 211–223.

<https://doi.org/10.1097/00006842-198603000-00006>

Janne, P., Reynaert, C., Cassiers, L., Huber, W., de Coster, P., Marchandise, B., & Kremer, R. (1987). Psychological determinants of silent myocardial

ischaemia. *European heart journal*, 8, 125–129.

https://doi.org/10.1093/eurheartj/8.suppl_g.125

Janne, P. (1988). *De la douleur à la plainte: pour une compréhension psychosomatique de l'ischémie myocardique dite silencieuse* (Doctoral dissertation). Université Catholique de Louvain, Louvain-la-Neuve. Retrieved from <https://dial.uclouvain.be/pr/boreal/object/boreal:149155>

Janne, P., Reynaert, C., De Coster, P., Vause, M., Cassiers, L., Detry, J.M., Kremer, R. (1988). The spouse as a possible anginal warning system in silent myocardial ischaemia. *European Heart Journal*, 9(1), 21-24. https://doi.org/10.1093/eurheartj/9.suppl_N.21

Janne, P., Reynaert, C., Cassiers, L. (1990). Dénier et maladie coronarienne - Pour une reconsidération topique du mécanisme de déni dans les maladies psychosomatiques et la maladie coronarienne en particulier. *Annales médico-psychologiques*, 148(2), 165-78.

Ketterer, M., Denollet, J., Chapp, J., Thayer, B., Keteyian, S., Clark, V., John, S., Farha, A., & Deveshwar, S. (2004). Men deny and women cry, but who dies? Do the wages of “denial” include early ischemic coronary heart disease? *Journal of Psychosomatic Research*, 56(1), 119–123. [https://doi.org/10.1016/S0022-3999\(03\)00501-4](https://doi.org/10.1016/S0022-3999(03)00501-4)

Ladwig, K. H., Meisinger, C., Hymer, H., Wolf, K., Heier, M., von Scheidt, W., & Kuch, B. (2011). Sex and age specific time patterns and long term time trends of pre-hospital delay of patients presenting with acute ST-segment elevation MI. *International journal of cardiology*, 152(3), 350–355. <https://doi.org/10.1016/j.ijcard.2010.08.003>

Lazarus, R. S. (1983). The costs and benefits of denial. In S. Breznitz (Ed.), *The denial of stress* (pp. 1–30). New York: International Universities Press.

- Lee, S. H., Kim, H. K., Jeong, M. H., Lee, J. M., Gwon, H. C., Chae, S. C., Seong, I. W., Park, J. S., Chae, J. K., Hur, S. H., Cha, K. S., Kim, H. S., Seung, K. B., Rha, S. W., Ahn, T. H., Kim, C. J., Hwang, J. Y., Choi, D. J., Yoon, J., Joo, S. J., ... KAMIR Investigators. (2020). Pre-hospital delay and emergency medical services in acute MI. *The Korean journal of internal medicine*, 35(1), 119–132. <https://doi.org/10.3904/kjim.2019.123>
- Lengelé, B. & Behets Wydemans, C. (2020). *Anatomie générale et fonctionnelle*. Unpublished document, Université Catholique de Louvain, Bruxelles Woluwe.
- Levenson, J. L., Kay, R., Monteferrante, J., & Herman, M. V. (1984). Denial predicts favorable outcome in unstable angina pectoris. *Psychosomatic medicine*, 46(1), 25–32. <https://doi.org/10.1097/00006842-198401000-00005>
- Levine, J., Warrenburg, S., Kerns, R., Schwartz, G., Delaney, R., Fontana, A., Gradman, A., Smith, S., Allen, S., & Cascione, R. (1987). The role of denial in recovery from coronary heart disease. *Psychosomatic medicine*, 49(2), 109–117. <https://doi.org/10.1097/00006842-198703000-00001>
- Ligue Cardiologique Belge. (n.d.). *L'infarctus du myocarde*. Retrieved from <https://liguecardioliga.be/infarctus-du-myocarde/>
- Marchetti, E. (2012). Entre la réalité des atteintes somatiques et les réactions émotionnelles des patients: les théories subjectives comme base d'un accompagnement psychologique. L'exemple des personnes victimes d'un infarctus du myocarde (pp 135-149). In P. Brun (Eds.), *Du nouveau dans la psycho ? Y a-t-il du nouveau dans la pratique et la théorie de la psychologie à l'hôpital ?* (pp. 135-149). Nîmes, France : Champs social Éditions.
- Marcus, E. R. (1999). Modern Ego Psychology. *Journal of the American Psychoanalytic Association*, 47(3), 843–871. <https://doi.org/10.1177/00030651990470031501>

- Mehta, P. K., Wei, J., & Wenger, N. K. (2015). Ischemic heart disease in women: A focus on risk factors. *Trends in Cardiovascular Medicine*, 25(2), 140–151. <https://doi.org/10.1016/j.tcm.2014.10.005>
- Mendis, S., Puska, P., Norrving, B., World Health Organization, World Heart Federation, & World Stroke Organization (Eds.). (2011). *Global atlas on cardiovascular disease prevention and control*. Geneva : World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/44701>
- Mendis, S., Thygesen, K., Kuulasmaa, K., Giampaoli, S., Mahonen, M., Ngu Blackett, K., Lisheng, L., & Writing group on behalf of the participating experts of the WHO consultation for revision of WHO definition of MI. (2011). World Health Organization definition of MI: 2008-09 revision. *International Journal of Epidemiology*, 40(1), 139–146. <https://doi.org/10.1093/ije/dyq165>.
- Mendes de Leon, C. F. (1992). Anger and impatience/irritability in patients of low socioeconomic status with acute coronary heart disease. *Journal of behavioral medicine*, 15(3), 273–284. <https://doi.org/10.1007/BF00845356>
- Mikolajczak, M. (2013). *Les interventions en psychologie de la santé*. Paris: Dunod.
- Miller, W. B., & Rosenfeld, R. (1975). A psychophysiological study of denial following acute MI. *Journal of psychosomatic research*, 19(1), 43–54. [https://doi.org/10.1016/0022-3999\(75\)90050-1](https://doi.org/10.1016/0022-3999(75)90050-1)
- Modica, M., Castiglioni, P., Minotti, A., Faini, A., Racca, V., & Ferratini, M. (2018). Psychological Profile in Coronary Artery By-Pass Graft Patients vs. Valve Replacement Patients Entering Cardiac Rehabilitation after Surgery. *Scientific Reports*, 8(1), 14381. <https://doi.org/10.1038/s41598-018-32696-5>
- National Heart, Lung and Blood Institute. (n.d.-a). *Coronary Heart Disease*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/coronary-heart-disease>

- National Heart, Lung and Blood Institute. (n.d.-b). *Angina*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/angina>
- National Heart, Lung and Blood Institute. (n.d.-c). *Cardiac Catheterization*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/cardiac-catheterization>
- National Heart, Lung and Blood Institute. (n.d.-d). *Percutaneous Coronary Intervention*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/percutaneous-coronary-intervention>
- National Heart, Lung and Blood Institute. (n.d.-e). *Coronary Artery Bypass Grafting*. Retrieved from <https://www.nhlbi.nih.gov/health-topics/coronary-artery-bypass-grafting>
- National Institute on Aging. (2018). *Heart Health and Aging*. Retrieved from <https://www.nia.nih.gov/health/heart-health-and-aging>
- Nilsson, G., Mooe, T., Söderström, L., & Samuelsson, E. (2016). Pre-hospital delay in patients with first time MI: an observational study in a northern Swedish population. *BMC cardiovascular disorders*, 16, 93.
<https://doi.org/10.1186/s12872-016-0271-x>
- O'Carroll, R. E., Smith, K. B., Grubb, N. R., Fox, K. A., & Masterton, G. (2001). Psychological factors associated with delay in attending hospital following a MI. *Journal of psychosomatic research*, 51(4), 611–614.
[https://doi.org/10.1016/s0022-3999\(01\)00265-3](https://doi.org/10.1016/s0022-3999(01)00265-3)
- Perkins-Porras, L., Whitehead, D. L., Strike, P. C., & Steptoe, A. (2008). Causal beliefs, cardiac denial and pre-hospital delays following the onset of acute coronary syndromes. *Journal of behavioral medicine*, 31(6), 498–505.
<https://doi.org/10.1007/s10865-008-9174-3>

- Perkins-Porras, L., Whitehead, D. L., Strike, P. C., & Steptoe, A. (2009). Pre-hospital delay in patients with acute coronary syndrome: factors associated with patient decision time and home-to-hospital delay. *European journal of cardiovascular nursing : journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology*, 8(1), 26–33.
<https://doi.org/10.1016/j.ejcnurse.2008.05.001>
- Perry, J.C., Guelfi, J.D., Despland, J.N., Hanin, B. (2004). *Échelles d'évaluation et mécanismes de défense*. Paris: Masson.
- Rossi Ferrario, S., Giorgi, I., Baiardi, P., Giuntoli, L., Balestroni, G., Cerutti, P., Manera, M., Gabanelli, P., Solara, V., Fornara, R., Luisetti, M., Omarini, P., Omarini, G., & Vidotto, G. (2017). Illness denial questionnaire for patients and caregivers. *Neuropsychiatric disease and treatment*, 13, 909–916.
<https://doi.org/10.2147/NDT.S128622>
- Rossi Ferrario, S., Panzeri, A., Anselmi, P., & Vidotto, G. (2019). Development and psychometric properties of a short form of the Illness Denial Questionnaire. *Psychology research and behavior management*, 12, 727–739.
<https://doi.org/10.2147/PRBM.S207622>
- Rozanski, A., Blumenthal, J. A., & Kaplan, J. (1999). Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. *Circulation*, 99(16), 2192–2217.
<https://doi.org/10.1161/01.cir.99.16.2192>
- Schacter, D. L. (2011). *Psychology Second Edition*. New York: Worth Publishers.
- Shaw, R.E., Cohen, F., Doyle, B., Palesky, J. (1985). The impact of denial and repressive style on information gain and rehabilitation outcomes in MI patients. *Psychosomatic Medicine*, 47(3), 262–273.
<https://doi.org/10.1097/00006842-198505000-00004>

- Sirois, F. (1992). Le déni dans la maladie coronarienne. *Canadian Medical Association journal*, 147(3), 315–321.
- Stenström, U., Nilsson, A. K., Stridh, C., Nijm, J., Nyrinder, I., Jonsson, A., Karlsson, J. E., & Jonasson, L. (2005). Denial in patients with a first-time MI: relations to pre-hospital delay and attendance to a cardiac rehabilitation programme. *European journal of cardiovascular prevention and rehabilitation : official journal of the European Society of Cardiology, Working Groups on Epidemiology & Prevention and Cardiac Rehabilitation and Exercise Physiology*, 12(6), 568–571.
<https://doi.org/10.1097/01.hjr.0000186620.75733.15>
- Suls, J., Green, P., Rose, G., Lounsbury, P., & Gordon, E. (1997). Hiding worries from One's spouse: associations between coping via protective buffering and distress in male post-MI patients and their wives. *Journal of behavioral medicine*, 20(4), 333–349. <https://doi.org/10.1023/a:1025513029605>
- Tajeddine, N. (2016). *Physiologie humaine, y compris éléments de neurophysiologie*. Unpublished document, Université Catholique de Louvain, Louvain-la-Neuve
- Triandis, H.C. (Ed.). (1980). *Handbook of cross-cultural psychology*. Boston: Allyn and Bacon.
- Vaillant, G. E. (1992). *Ego mechanisms of defense: A guide for clinicians and researchers*. Washington, DC: American Psychiatric Press.
- Van den Broucke, S. (2018). *Psychologie de la Santé*. Unpublished document, Université Catholique de Louvain, Louvain-la-Neuve
- Venes, D., Biderman, A., & Fenton, B. G. (2009). *Taber's cyclopedic medical dictionary*. Philadelphia: F.A. Davis Company.

- von Känel, R., Hari, R., Schmid, J. P., Saner, H., & Bègré, S. (2011). Distress related to MI and cardiovascular outcome: a retrospective observational study. *BMC psychiatry*, *11*, 98. <https://doi.org/10.1186/1471-244X-11-98>
- Vos, M. S., Putter, H., van Houwelingen, H. C., & de Haes, H. C. (2010). Denial and physical outcomes in lung cancer patients, a longitudinal study. *Lung cancer (Amsterdam, Netherlands)*, *67*(2), 237–243. <https://doi-org.proxy.bib.ucl.ac.be:2443/10.1016/j.lungcan.2009.04.003>
- Weidner, G. (2000). Why do men get more heart disease than women? An international perspective. *Journal of American college health*, *48*(6), 291–294. <https://doi.org/10.1080/07448480009596270>
- Weinhaus, A. J., & Roberts, K. P. (2009). Anatomy of the Human Heart. In P. A. Iaizzo (Ed.), *Handbook of Cardiac Anatomy, Physiology, and Devices* (pp. 59–85). Totowa, New Jersey : Humana Press. https://doi.org/10.1007/978-1-60327-372-5_5
- Whitehead, D.L, Strike P, Perkins-Porras L, Steptoe A. (2005). Frequency of distress and fear of dying during acute coronary syndromes and consequences for adaptation. *The American Journal of Cardiology*, *96*(11), 1512–1516 <https://doi.org/10.1016/j.amjcard.2005.07.070>
- Whitehead, D. L., Perkins-Porras, L., Strike, P. C., & Steptoe, A. (2006). Post-traumatic stress disorder in patients with cardiac disease: predicting vulnerability from emotional responses during admission for acute coronary syndromes. *Heart (British Cardiac Society)*, *92*(9), 1225–1229. <https://doi.org/10.1136/hrt.2005.070946>
- Wigger, E. (2011). *Denial and cardiovascular health*. Retrieved from the Web site of Unhealthy Work, the center for social epidemiology <https://unhealthywork.org/psychological-risk-factors/denial-and-cardiovascular-health/>

World Health Organization. (2017). *Cardiovascular Diseases (CVDs)*. Retrieved from [https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))

Wyman, M.F., Shiovitz-Ezra, S., Bengel J. (2018). Ageism in the Health Care System: Providers, Patients, and Systems. In Ayalon L., Tesch-Römer C. (Eds.), *Contemporary Perspectives on Ageism - International Perspectives on Aging* (pp.193-212). Cham, Switzerland: Springer Nature.
https://doi.org/10.1007/978-3-319-73820-8_13

Zipes, D. P., Libby, P., Bonow, R. O., Mann, D. L., Tomaselli, G. F., & Braunwald, E. (Eds.). (2019). *Braunwald's heart disease: A textbook of cardiovascular medicine*. Philadelphia : Elsevier.

Appendix

1. Survey of the study

ÉTUDE RELATIVE AU VÉCU DE LA MALADIE CARDIAQUE

Nom :

Prénom :

Date de naissance :

INSTRUCTIONS AU PATIENT

Bonjour, nous vous remercions pour votre participation à cette étude. Cette étude s'intéresse à la façon dont vous et votre entourage faites face à votre maladie coronarienne. Il n'y a pas de bonne ou de mauvaise réponse. Il s'agit simplement de répondre honnêtement et spontanément.

Vous êtes totalement libre de participer à cette recherche et d'arrêter votre participation à tout moment et ce, sans justification. Vos données seront traitées de manière strictement confidentielle. Elles ne seront en aucun cas communiquées à des tiers. Le temps de complétion du questionnaire est de 10 minutes. Nous sommes disponibles afin de répondre à toute question. Vous pouvez également nous contacter à l'adresse e-mail suivante : emilie.banse@student.uclouvain.be.

Cette étude est réalisée sous la supervision des Professeurs Maximilien Gourdin, Directeur aux Affaires Académiques, Pascal Janne, conseiller à la direction Médicale au CHU-UCL-Namur, et Antoine Guedes, Chef du service de cardiologie au CHU-UCL-Namur, site Godinne.

Merci d'avance !

Sur base des informations qui précèdent, merci de confirmer votre accord pour participer à la recherche et autoriser l'utilisation des données à des fins scientifiques ainsi que la publication éventuelle des résultats de la recherche dans des revues scientifiques.

J'accepte :

Veillez entourer une seule des propositions suivantes : Oui / Non

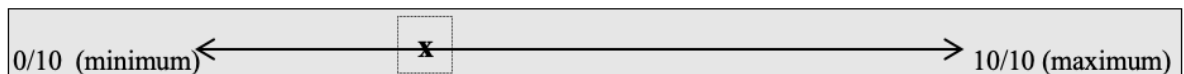
I. Informations générales du patient

Ces premières questions s'intéressent à quelques informations générales à votre sujet. Pour chaque question, veuillez entourer la bonne réponse (parfois, une précision vous sera demandée).

1. *Quel est votre genre ?* Masculin / Féminin.
2. *Quelle est votre nationalité ?* Belge / Français / Luxembourgeois / autre (précisez) : ...
3. *Quel est votre âge ?* Veuillez indiquer un chiffre : ...
4. *Êtes-vous actuellement en couple ?* Oui / Non
Si non, veuillez indiquer quelle est la personne qui vous aide le plus à faire face à votre maladie (vous accompagne aux rendez-vous médicaux, la personne vers qui le personnel médical s'adresse pour expliquer la situation actuelle, ...) :
5. *Combien d'enfants avez-vous à charge ?* Veuillez indiquer un chiffre : ...

II. Vécu de votre maladie

Les questions suivantes s'intéressent à la manière dont vous avez vécu et vivez votre maladie cardiaque. Pour chaque affirmation ou question, indiquez **au moyen d'une croix** quel est votre degré d'accord/score sur l'échelle comme dans l'exemple qui suit



1. *Je suis préoccupé(e) par cette maladie.*

0/10 (minimum) ←————→ 10/10
(maximum)

2. *Cette maladie m'effraie.*

0/10 (minimum) ←————→ 10/10
(maximum)

3. *Cette maladie me fait me sentir triste.*

0/10 (minimum) ←————→ 10/10
(maximum)

4. *Je fais face à tout avec sérénité.*

0/10 (minimum) ←————→ 10/10
(maximum)

5. *Cette maladie est une lourde épreuve à porter pour moi.*

0/10 (minimum) ←—————→ 10/10
(maximum)

6. *Je pense souvent à la façon dont les choses vont se dérouler.*

0/10 (minimum) ←—————→ 10/10
(maximum)

7. *J'essaye de ne prêter aucune attention à ma maladie.*

0/10 (minimum) ←—————→ 10/10
(maximum)

8. *J'essaye de ne pas parler de cette maladie.*

0/10 (minimum) ←—————→ 10/10
(maximum)

9. *Parfois, j'essaye de me convaincre que je n'ai pas cette maladie.*

0/10 (minimum) ←—————→ 10/10
(maximum)

III. Vécu de la situation par votre proche

Pensez à présent à la personne qui, dans votre entourage, a été la plus présente pour vous aider à faire face à cette maladie. C'est généralement vers cette personne que se tourne également le personnel médical afin de donner des informations relatives à votre état de santé et son évolution. Pour chaque affirmation ou question, indiquez **au moyen d'une croix** quel est votre degré d'accord/score sur l'échelle.

1. *Selon moi, cette personne est une personne de nature anxieuse et stressée.*

0/10 (minimum) ←—————→ 10/10
(maximum)

2. *Cette personne a très mal vécu le diagnostic de ma maladie.*

0/10 (minimum) ←—————→ 10/10
(maximum)

3. *Cette personne a été présente à chacun de mes rendez-vous médicaux en rapport avec ma maladie.*

0/10 (minimum) ←—————→ 10/10
(maximum)

4. *J'ai envie de protéger cette personne en ne lui disant pas tout.*

0/10 (minimum) ←—————→ 10/10
(maximum)

5. *Cette personne souffre plus de ma situation médicale que moi-même.*

0/10 (minimum) ←—————→ 10/10
(maximum)

6. *J'ai peur que cette personne soit trop anxieuse par rapport à ma situation médicale.*

0/10 (minimum) ←—————→ 10/10
(maximum)

7. *J'ai l'impression que cette personne n'a plus confiance en mes capacités physiques et cardiaques.*

0/10 (minimum) ←—————→ 10/10
(maximum)

8. *Cette personne vient me rendre visite (à la maison ou lors d'une hospitalisation)...*

0/10 (minimum) ←—————→ 10/10
(maximum)

9. *Cette personne m'appelle ou prend de mes nouvelles ...*

0/10 (minimum) ←—————→ 10/10
(maximum)

10. *Cette personne m'accompagne à mes rendez-vous médicaux...*

0/10 (minimum) ←—————→ 10/10
(maximum)

IV. Clôture du questionnaire

Nous tenons à vous remercier chaleureusement pour votre participation !

Les données récoltées nous aideront à mieux comprendre la façon dont les patients ainsi que leur entourage font face à la maladie cardiaque. Si vous avez des questions, n'hésitez pas à contacter emilie.banse@student.uclouvain.be.

2. Descriptive statistics

Table 1 and 2. Characteristics of the sample (N = 66).

	N (%)
Gender	
Male	54 (81.8%)
Female	11 (16.7%)
Missing data	1(1.5%)
Nationality	
Belgian	55 (83.3%)
French	6 (9.1%)
Italian	2 (3.0%)
Polish	1 (1.5%)
Missing data	2 (3.0%)
In a relationship	
No	13 (19.7%)
Yes	51 (77.3%)
Missing data	2 (3.0%)
Number of children to care for	
0	43 (65.2%)
1	5 (7.6%)
2	4 (6.1%)
3	6 (9.1%)
5	1 (1.5%)
Missing data	7 (10.6%)
MI	
No	17 (25.8%)
Yes	37 (56.1%)
Missing data	12 (18.2%)
Heart surgery	
No	29 (43.9%)
Yes	25 (37.9%)
Missing data	12 (18.2%)

	N	Mean	Std. Deviation	Range of scores	
				Min	Max
Age	65	66.54	9.04	46	86
Number of years since first coronary event	54	7.96	9.86	1	42

Table 3. Descriptive statistics on the main variables assessed.

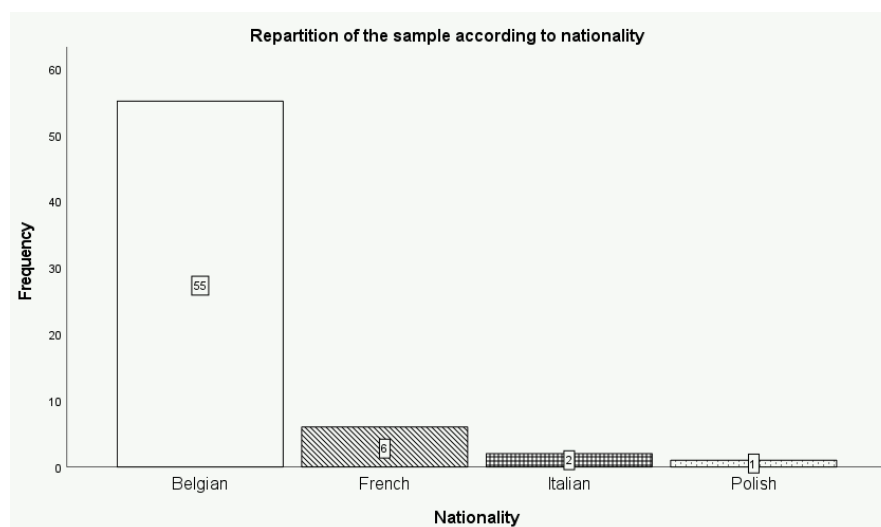
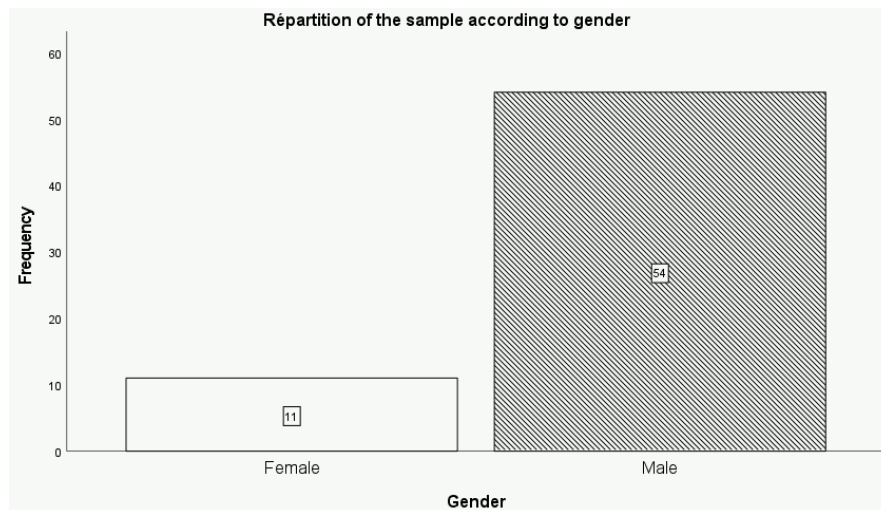
	N	Mean	SD	Range of scores		Distribution		α
				Min	Min	Kurtosis	Skewness	
Denial	66	34.98	11.39	8.30	8.30	-.39	-.14	0.8
Conscious avoidance	66	9.47	5.49	0.80	0.80	-1.06	.13	0.49
Perceived anxiety of significant other	66	34.18	13.65	0.00	0.00	-.00	-.17	0.72

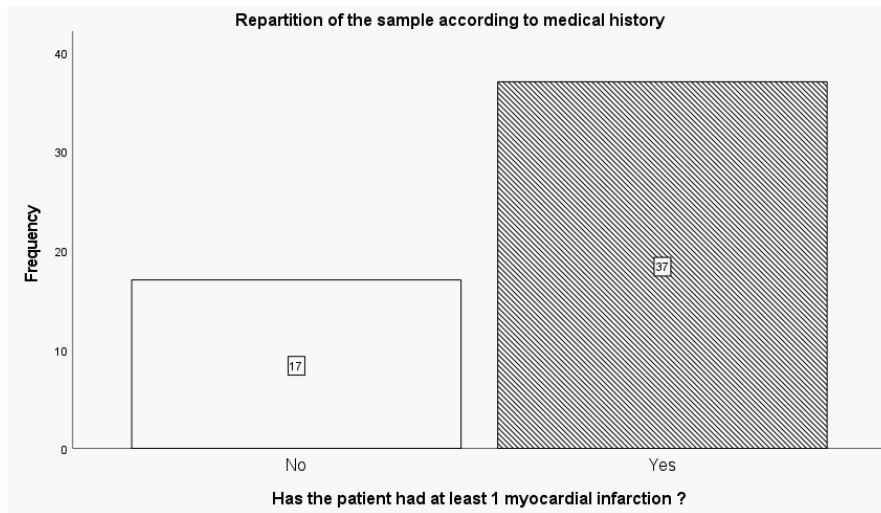
Table 4. Descriptive statistics on the items that constitute the global score of denial.

	N	Mean	SD	Variance	Range of scores	
					Min	Min
I am worried by this disease.	66	5.09	2.53	6.41	0.1	10.0
This disease frightens me.	66	6.01	2.76	7.62	0.9	10.0
This disease makes me feel sad.	66	6.78	2.76	7.60	1.0	10.0
I am facing everything with serenity.	64	6.36	2.66	7.15	0.0	10.0
This disease is a heavy trial for me to bear.	66	5.72	2.70	7.29	0.1	10.0
I often think about how things are going to turn out.	65	5.31	2.71	7.33	0.1	10.0

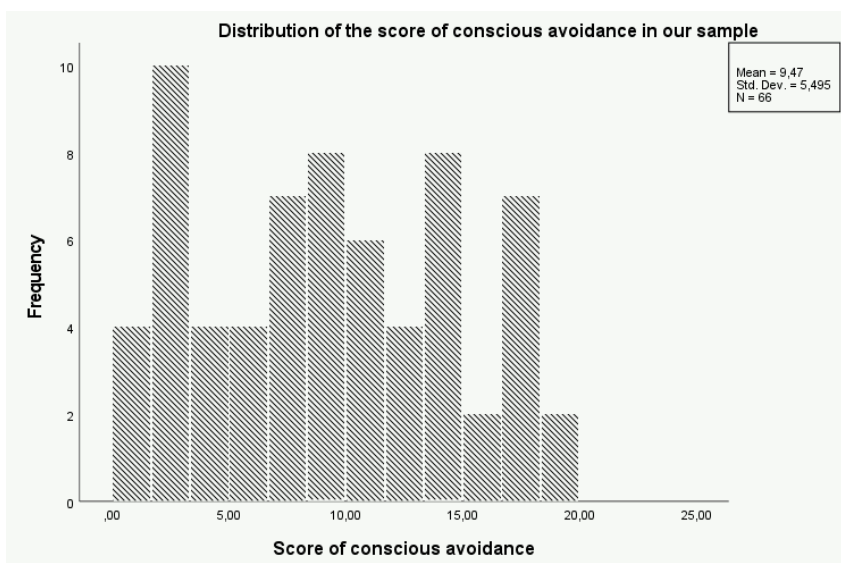
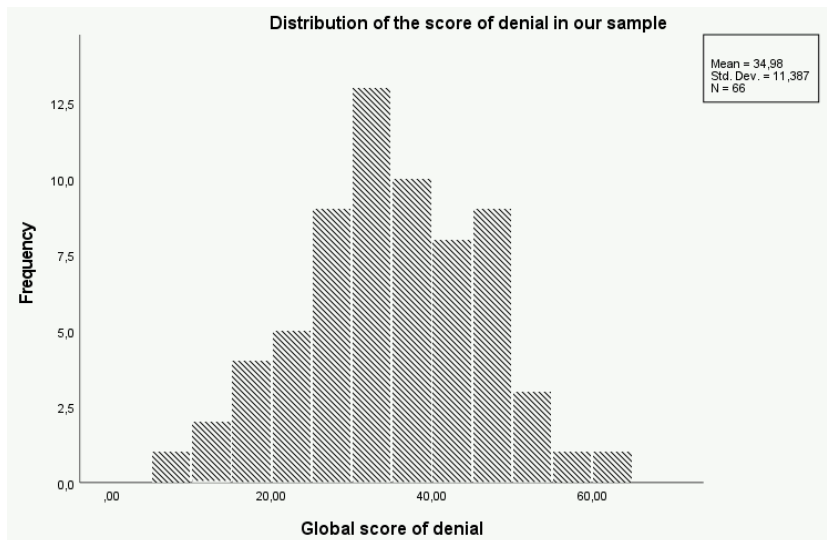
I try not to pay any attention to my disease.	66	3.60	2.49	6.22	0.0	10.0
I try not to speak about this disease.	66	3.42	2.63	6.90	0.0	10.0
At times I try to convince myself that i do not have any disease.	64	2.52	2.67	7.13	0.0	10.0

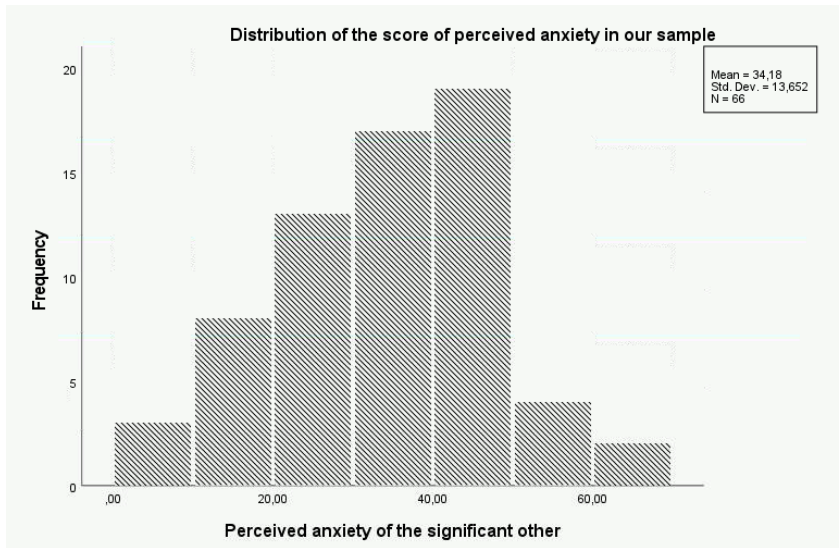
Graphs 1 to 3. Repartition of the sample according to gender, nationality and medical history of MI.



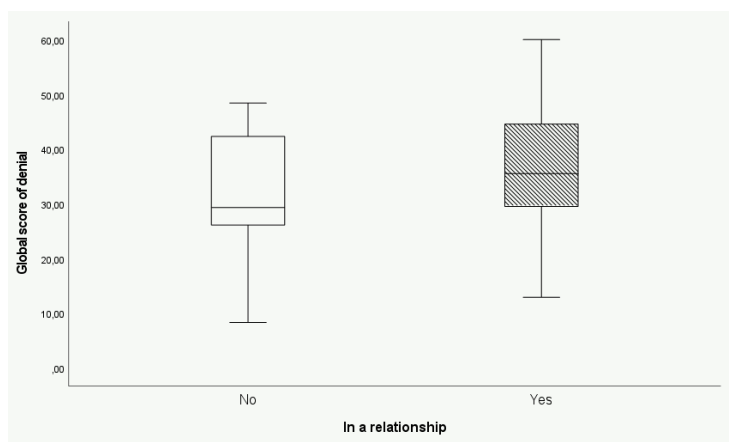
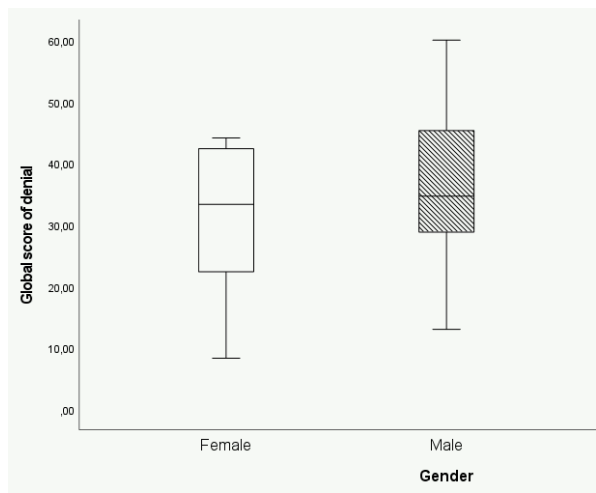


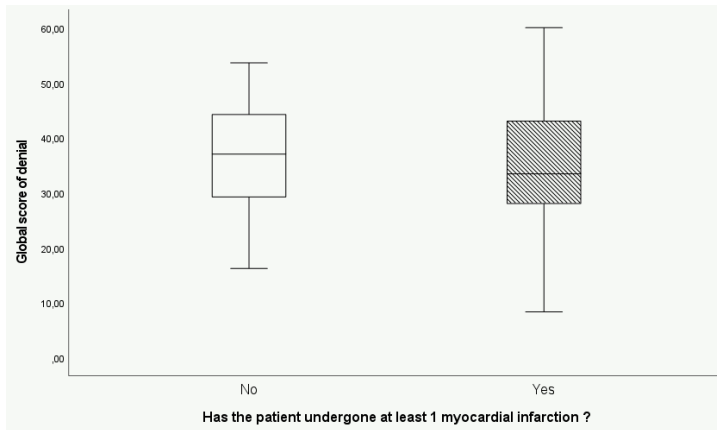
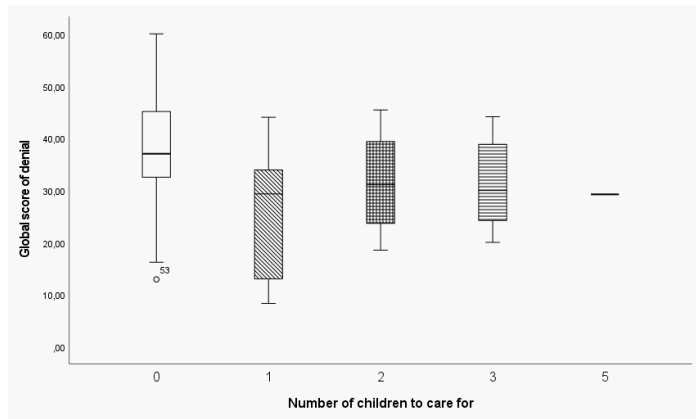
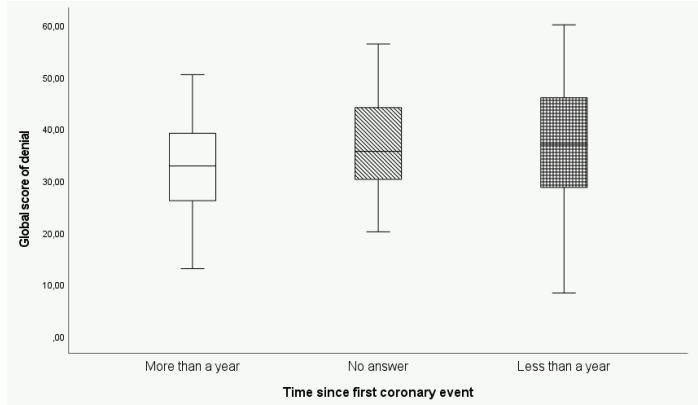
Graph 4 to 6. Histograms of denial, conscious avoidance, and perceived anxiety of the significant other.



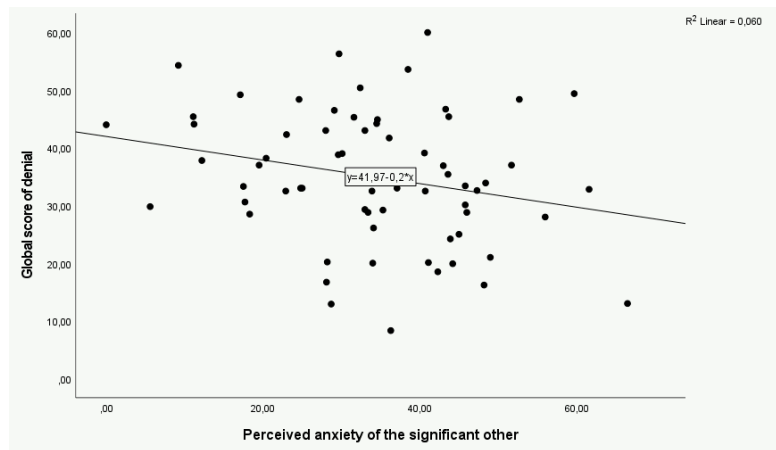
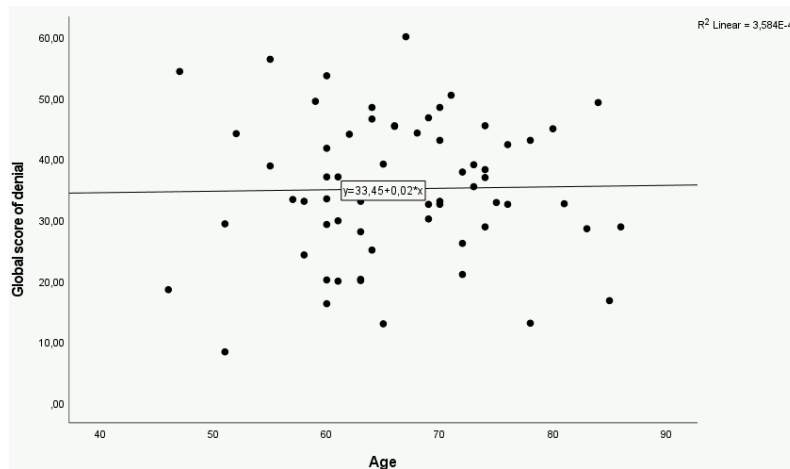


Graph 7 to 11. Global denial depending on gender, being in a relationship, medical history, number of children to care for, presence of MI.





Graph 12 and 13. Global denial depending on age and perceived anxiety of the significant other.



3. Inferential statistics and data analysis

Table 1a. T test on independent samples: denial according to gender.

Score of denial	N	Mean	SD	t	df	Sig (2-tailed)	95% Confidence interval	
							Lower	Upper
Male	54	35.87	11.07	1.281	63	.205	-2.71	12.37
Female	11	31.03	13.03					

Table 1b. Mann-Whitney test: denial according to gender.

Score of denial	N	Median	SD	U	W	Z	Sig (2-tailed)
Male	54	35.87	11.07	235.50	301.50	-1.08	.282
Female	11	31.03	13.03				

Table 2. Spearman correlation: denial according to age.

	Age	Global score of denial
Age	Spearman's rho	1
	Sig (2-tailed)	.023
	N	65
Global score of denial	Spearman's rho	.023
	Sig (2-tailed) for Pearson	.857
	N	65

Table 3a. T test on independent samples: denial according to being in a relationship or being single.

Score of denial	N	Mean	SD	t	df	Sig (2-tailed)	95% Confidence interval	
							Lower	Upper
Single	13	31.13	11.40	-1.313	62	.194	-11.65	2.41
In a relationship	51	35.75	11.30					

Table 3b. Mann-Whitney test: denial according to being in a relationship or being single.

Score of denial	N	Median	SD	U	W	Z	Sig (2-tailed)
Single	13	29.30	11.40	245	336	-1.44	.149
In a relationship	51	35.50	11.30				

Table 4a. T test on independent samples: denial according to medical history. Patients with an ancient medical history have had their first coronary-related health problems more than a year ago.

Score of denial	N	Mean	SD	t	df	Sig (2-tailed)	95% Confidence interval	
							Lower	Upper
Ancient medical history	26	32.59	10.28	-1.271	52	.210	-10.28	2.30
Recent medical history	28	36.58	12.56					

Table 4b. Mann-Whitney test: denial according to medical history.

Score of denial	N	Median	SD	U	W	Z	Sig (2-tailed)
Ancient medical history	13	32.80	10.28	292	643	-1.25	.213
Recent medical history	51	36.95	12.56				

Table 5. Kruskal-Wallis Test: denial according to number of children.

Ranks			
Global score of denial	Number of children to care for	N	Mean Rank
	0	43	32.98
	1	5	19.20
	2	4	24.75
	3	6	23.33
	5	1	17.00
	Total	59	

Test statistics	
	Global score of denial
Kruskal-Wallis H	5.12
df	4
Asymp. Sig.	.275

Table 6a. T test on independent samples: denial according to presence or absence of a MI.

Score of denial	N	Mean	SD	t	df	Sig (2-tailed)	95% Confidence interval	
							Lower	Upper
No MI	17	36.45	10.10	-.767	52	.446	-9.45	4.22
One or more MI	37	33.83	12.25					

Table Gb. Mann-Whitney test: denial according presence or absence of a MI.

Score of denial	N	Median	SD	U	W	Z	Sig (2-tailed)
No MI	13	37.00	10.10	277.50	980.50	-1.25	.491
One or more MI	37	33.49	12.25				

Table 7. Spearman correlation: denial according to the patient's perception of anxiety of the significant other.

	Global score of denial	Perceived anxiety
Global score of denial	Spearman's rho	1
	Sig (2-tailed)	-.242*
	N	.050
Perceived anxiety	Spearman's rho	1
	Sig (2-tailed)	-.242*
	N	.050
	N	66
		66

* Correlation is significant at the .05 level (2-tailed).

Table 8. Spearman correlation: exploratory analysis on three subscales of IDQ

		Denial of negative emotions	Resistance to change	Conscious avoidance
Denial of negative emotions	Spearman's rho	1	-.577**	-.112
	Sig (2-tailed)		.00	.372
	N	66	66	66
Resistance to change	Spearman's rho	-.577**	1	-.182
	Sig (2-tailed)	.00		.143
	N	66	66	66
Conscious avoidance	Spearman's rho	-.112*	-.182	1
	Sig (2-tailed)	.372	.143	
	N	66	66	66

** Correlation is significant at the .01 level (2-tailed).

4. Raw data processing

In the next paragraph, a brief explanation is given on how raw data was used before computing statistical analyses. For each participant, information was obtained on sociodemographic variables, medical information (if the patient agreed to), denial and perceived presence and anxiety of the significant other.

Sociodemographic variables such as gender, nationality, status of relationship were considered as qualitative nominal variables of two or more levels. Age was considered as a quantitative continuous variable. Number of children was transformed into a qualitative ordinal variable with different levels (0, 1, 2, 3, 5). The medical variables MI and medical history were also transformed into qualitative variables, with each time two groups being made. Regarding MI, based on the medical records of patients, patients were distributed into two groups (having had at least 1 MI or having had no MI at all). Regarding medical history, after checking into the patient's medical

records, patients were also distributed into two groups (having had their first heart-related problem in the last year or since longer). To find this medical information, we looked at the protocols letter, or the last report of hospitalization or of medical follow-up of the patient. Information was transposed on an excel file before being transposed into SPSS and doing the main transformations (using the “recode into” option). For the other variables of our survey (the 3 subscales of the IDQ and the variables of perceived anxiety and presence of the significant other), visual analogical scales from 0 to 10 were used as can be seen in this thesis’ first appendix. Patients had to put a cross where they wanted to indicate their position on all affirmations. To use these scores, we measured with a ruler what score the patient had (to the millimeter) on each item and transposed this into the excel file. This provided us with each time a continuous measure. Some items measuring denial were reversed (item 1, 2, 3, 5 and 6) and we therefore turned over our ruler to measure those scores. To obtain the scores on each of the 3 subscales of the IDQ, the 3 items that measured them were added up to obtain a total score. Denial of negative emotions and resistance to change were then also added up to obtain the global score of denial. The items measuring perceived anxiety (1 to 7 of the last part of the survey) (and presence; items 8,9 and 10 of the last part of the survey) were also added up.

5. A case study

Mr R is a 67 year-old man. The Master’s student met him in the cardiology unit where he had been admitted for a STEMI (this form of MI is characterized by a complete blockage in a coronary artery, *supra*). Before this event, Mr R had no other cardiac antecedents at all, even though he suffered from other pulmonary and lung issues. When meeting him, the student was rather disconcerted by the lack of anxiety he displayed. There was no emotion at all in the patient’s discourse, although he had just suffered from a MI and had to undergo a PCI the day after. Mr R told the student that his wife was far more anxious than him and that he had to look after her. What was also striking in what the patient said, is that he categorically refused to change his lifestyle, even though the doctors had strongly advised him to do so (for example, to stop smoking because he was a heavy smoker). He admitted that his stressful work probably contributed to his CHD. The student was baffled by the patient’s lack of will

to change anything even though he had just suffered from a MI. When looking at the patient's responses to denial and to the interpersonal context, results were quite interesting. Indeed, the patient answered with full numbers instead of drawing a cross to position himself on the different propositions. His answers regarding the items of denial were also extreme, as he obtained maximal scores (reversed items taken into account, he always answered either 0 or either 10) for *all* items of the three subscales of denial, except for the last item (*"Sometimes, I try to convince myself that I do not have this disease"*, where the patient scored 0). The patient had very high scores in denial of negative emotions, conscious avoidance and resistance to change. We could therefore say this patient denied his CHD (this patient having suffered from a MI). When looking at the scores of perceived anxiety of the significant other, in this case the patient's wife, results were also quite interesting. Indeed, high scores were obtained on some items evaluating this. For example, a score of 8 was given to the items *"According to me, this person is a person of anxious and stressed nature"* and *"I worry that this person might be too anxious regarding my medical situation"*; a score of 10 was given to the item *"I want to protect this person by not telling her everything"*. Although no maximal scores were obtained on all items evaluating perceived anxiety of the patient's wife, some of them were still quite significative. The student had the impression that this patient was kind of denying his disease. His wife seemed more anxious than him regarding his medical condition. And, the survey's results also seemed to show that the patient felt the need to protect his wife. Those results were consistent with this thesis' hypothesis positing a relationship between MI, denial and influence of the interpersonal context.

6. Agreement of the Ethics Committee

Before starting the study that is the subject of this thesis, agreement was obtained by the Ethics Committee of the CHU UCL Namur (Godinne site) where the study took place. This is their agreement.



SITE DE GODINNE

COMITÉ D'ETHIQUE MÉDICALE

Président
Pr P. Evrard

Secrétaire
Pr G. Lawson

Tél. Sec. : +32 (0)81 42 33 28
Fax : +32 (0)81 42 30 23
comite.ethique.g-chu@uclouvain.be

Yvoir, le mardi 22 décembre 2020

AFMPS
Division R&D
Eurostation bloc 2
Place Victor Horta 40
Boîte 40
1060 BRUXELLES

Cc Professeur Maximilien GOURDIN
maximilien.gourdin@uclouvain.be

Cc Professeur Pascal JANNE
pascal.janne@uclouvain.be

Cc Mademoiselle Emilie BANSE
emilie.banse@student.uclouvain.be

ACCORD FINAL

Concerné:

- N° interne CE Mont-Godinne: 235/2020
- Numéro unique belge: B0392020000083
- Intitulé: Le déni chez le coronarien, un moyen de se protéger et de protéger l'autre.
- Investigateurs responsables : Professeur Maximilien GOURDIN – Professeur Pascal JANNE, Psychosomatique, CHU UCL Namur – site Godinne.
- Mémoire de Mademoiselle Emilie BANSE
- Étude académique monocentrique

Cher Confrère,

Le Comité d'Éthique du CHU UCL Namur, site Godinne, a examiné les documents suivants concernant l'étude susmentionnée:

- Formulaire de soumission simplifiée - mémoire.
- Modèle d'information aux patients.
- Protocole de mémoire.

Suite à votre courrier apportant les réponses à nos questions et remarques, **la Commission estime que l'expérimentation prévue peut être entreprise.**

A cette occasion, le Comité d'éthique rappelle cependant aux responsables de l'expérimentation qu'elle se réalisera sous leur responsabilité propre et que l'avis favorable donné par la Commission ne signifie en rien qu'elle en prend ou en partage la responsabilité.

La Commission vous demande, en outre, de veiller à informer clairement les participants sur d'éventuels risques encourus ainsi que sur toute investigation complémentaire qui ne serait pas directement en rapport avec leur état de santé.

CHU UCL NAMUR ASBL
Adresse de correspondance : avenue Docteur G. Thérasse, 1 - 5530 Yvoir (Belgique) - Tél. +32 (0)81 42 21 11
Siège social : avenue Docteur G. Thérasse, 1 - 5530 Yvoir (Belgique) - Tél. +32 (0)81 42 21 11 - BE 641.733.885
www.chuclnamur.be

COMITÉ D'ETHIQUE MÉDICALE

Président
Pr P. Evrard

Secrétaire
Pr G. Lawson

Tél. Sec. : +32 (0)81 42 33 28
Fax : +32 (0)81 42 30 23
comite.ethique.g-chu@uclouvain.be

Aucun participant ne peut être admis dans une expérimentation ou un essai clinique avant que le comité d'éthique n'ait donné un avis écrit favorable au projet.

Aucune modification ni changement au protocole ne peut être mis en route sans l'approbation préalable écrite du comité d'éthique via un amendement.

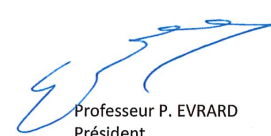
Nous rappelons que cette étude tombant sous le coup de la loi du 7 mai 2004, elle doit être couverte par une assurance sans faute.

Le comité d'éthique déclare qu'il procède selon les directives ICH/GCP, les lois et règlements applicables, et ses propres procédures écrites.

Nous vous remercions pour votre collaboration, et vous prions d'accepter, Chère Confrère, l'expression de nos sentiments les meilleurs.



Professeur G. LAWSON
Secrétaire



Professeur P. EVRARD
Président

Pour information:

Numéro du comité d'éthique attribué par le Comité Consultatif de Bioéthique: 039 (agrément complet 2014-2018)
Agreement of Institutional (non-US) Review Board: IRB00010947 (Expires 13/03/2020)

Abstract

Patients who suffer from coronary heart diseases often experience emotions such as fear, intense distress, anxiety or depression. As humans, we learn from a very young age to use defense mechanisms to protect ourselves. One of the defense mechanisms that patients use to cope with their coronary heart disease is denial. Denial is the way in which we refuse to acknowledge the existence or gravity of a problem, or its potential consequences. This can be more or less adaptive. Few studies have investigated the factors related to denial and the characteristics of patients who will be more susceptible to use it. This thesis' objective was to investigate those factors, based on a psychosomatic approach. 66 patients suffering from coronary heart diseases were scored on their level of denial and different sociodemographic, medical and interpersonal variables in this cross-sectional study. High variability of the scores of both denial ($M = 34.98 \pm 11.39$) and perceived anxiety of the significant other ($M = 34.18 \pm 13.65$) were observed. Results pointed to the fact that denial is relatively independent from most of the investigated variables, like age, gender, the fact to be in a relationship, or the medical history, making it therefore difficult to target specific populations of patients more at risk to deny. A significant result was however found when it came to the relationship between the patient and his close relatives' perceived anxiety ($r_s = -.242, p = .05$). This indicated the need to take the patient's interpersonal context into account. In future research, other variables such as personality should be evaluated with regard to their influence on possible denial. Targeting more at risk patients could lead to clinical interventions for coronary heart diseases patients, by helping them to face and progressively integrate their disease.

