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Highlighting emotions through concept mapping: an exploratory study of adolescent patients

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Abstract – Introduction: Too often neglected to the detriment of therapeutic patient education (TPE), emotions occupy a fundamental place in pedagogy. They deserve to be explored more deeply. **Objective:** This empirical, qualitative study tests the feasibility of a new technique to elicite and highlighten emotions liked to knowledge organization. **Methods:** In this study, the patient creates a structure referred to as a "concept map/emotion map" (CM-EM) starting from a concept mapping activity. The emotion map is composed of symbols and colors. The technique is tested on 13 adolescents ranging from 11 to 15 year old, with a range of pathologies (cystic fibrosis, diabetes, asthma). The patients are treated in various health care facilities in the city of Nantes. The opinions of patients and observers are solicited to identify the advantages and limitations of this method. **Results:** The maps themselves and interviews with adolescents and caregivers show the effectiveness of the method for revealing the patients' emotions patients. We also describe its educational limitations. **Conclusion:** At this stage of the study, the CM-EM permits a patient to better understand the emotions evoked by his/her illness, and to communicate to the caregiver the nature and intensity of his/her emotions linked to his/her knowledge organization. In return, and this is a new hypothesis, eliciting and highlighting emotions could modify the knowledge organization.

Key words: therapeutic patient education / concept map / emotions / adolescents / educational diagnosis

Résumé – Mise en évidence des émotions à partir de la carte conceptuelle : étude exploratoire auprès de patients adolescents. Introduction : Trop souvent négligées et porteuses de freins pour l'Éducation Thérapeutique du Patient (ETP), les émotions occupent une place fondamentale dans la démarche éducative du patient. Elles méritent d'être explorées plus en profondeur. **Objectif :** Cette étude empirique, qualitative vise à tester la faisabilité d'une technique facilitant l'expression et la mise en évidence des émotions au cours d'une exploration de l'organisation des connaissances de jeunes patients. **Méthodes :** À partir de la réalisation d'une carte conceptuelle (champ des connaissances), une carte appelée pour les besoins de l'étude « Carte conceptuelle-Carte des émotions » (champ des émotions) est retranscrite au moyen de symboles et de couleurs. La technique est testée auprès de 13 adolescents de 11 à 15 ans atteints de diverses pathologies (mucoviscidose, diabète, asthme) dans différentes structures de soins de la ville de Nantes. L'opinion des patients et des observateurs est sollicitée pour identifier les avantages et limites. **Résultats :** Les analyses des cartes réalisées, les résultats d'entretiens auprès des adolescents et des soignants observateurs, attestent de la faisabilité de cette technique pour mettre en évidence les émotions des adolescents. Des limites pédagogiques sont relevées. **Conclusion :** À ce stade de l'étude, la carte conceptuelle-carte des émotions permet au patient de comprendre les émotions que sa maladie lui procure et informe le soignant sur la nature et l'intensité des émotions ressenties par son patient en lien avec l'organisation de ses connaissances. Cette mise en lien pourrait dans un deuxième temps modifier cette organisation.

Mots clés : éducation thérapeutique du patient / carte conceptuelle / émotions / adolescents / diagnostic éducatif

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1 Introduction

Patients suffering from a chronic illness need opportunities to express their emotions; this principle is of fundamental importance in any therapeutic approach [1]. In our study, the term *emotion* is employed in its accepted psychological meaning: a particular phenomenon belonging to the range of affective states. Among these phenomena we can distinguish "feelings" (friendship, hate, and jealousy), "moods", and "affects". The latter refer to the most essential aspects of emotional experience: pleasure and displeasure. "Affective outbursts" may be positive (a surge of hope or exaltation) or negative (discouragement, disappointment...) [2]. Among all these states, "emotions" are the most prominent, intense, and accentuated; they are acute phenomena. Emotions are abrupt, sudden manifestations that interrupt the ongoing subject-environment interaction, causing a shift from one state to another [3]. According to Paul Ekman (1992), regardless of their culture, stage of development, or society, humans can recognize in each other four basic emotions: joy, sadness, anger, and fear. Surprise and disgust are sometimes added to this list [4].

Due to its irreversibility and the risk of aggravation, chronic illness induces a fear of continued health loss and a closer relationship with death. Patients with a chronic illness systematically suffer from numerous, varied, and often violent emotional disorders [5]. If a patient does not express his emotions, hiding behind silence, the things left unspoken quickly become obstacles to the patient-caregiver relationship [6]. Even if a direct relationship between the severity of the illness and the subjective suffering of the patient does not seem to be established, it is known that the patient's investment in the treatment depends essentially on his/her ability to share this subjective suffering and its associated emotions with the doctor [7]. For example, unexpressed anger can influence the attitude of the patient and translate into refusal of treatment [8, 9]. Caregivers have implemented several methods to take patient emotions into account, therapeutic education being one of the most important. This approach requires patients to acquire self-care and psycho-social skills with the goal of adapting to and managing their illness [10]. Even though learning and applying a skill generates emotion, the presence of skills based on managing emotions proves their importance.

Thus, in the field of therapeutic education, understanding and managing one's emotions is not just a goal in itself, but at the same time constitutes a state inherent to the patient's learning [11]. Indeed, the emotion felt by the patient is linked to the content mobilized during education and to transformations taking place within the patient during skill acquisition. However, as it is the case of a health-related behavior, emotions can block the learning process by influencing the patient's intellectual availability [12]. Emotions often play the role of a perturbation, slowing the development of new concepts and the growth of connections to preexisting knowledge [13]. Thus, expressing emotion during learning, even in a symbolic mode, predisposes the individual to health behaviors that evoke a different relationship with the experienced emotions. When a caregiver recognizes that emotions have their place in the patient, it immediately signals the authenticity of an educational relationship and stimulates the patient's engagement in therapeutic education [1].

The TPE methodology has several important phases, but *educational diagnosis* is particularly useful for allowing patients to express their emotions [6]. In order to permit caregivers to learn what the patient already understands concerning his/her illness and its treatment, and to permit the patient to express his/her needs, it is essential that this stage take into account whatever emotions are present. Only thus can the diagnosis lead to a educational relationship where the caregiver's attitude is centered on the patient's representations and emotions.

Sick children may find it particularly difficult to talk about the feelings evoked by living with a disease. They feel impotent faced with the illness and its treatment [14], and these emotions are difficult to express. Many tools and techniques are available to ease this process during an educational diagnosis. Interviews are common, supplemented with photolanguage [1], genograms [15], or concept maps (CM) [16, 17] depending on the domain being investigated.

We have not found prior works in the literature indicating that concept mapping (CM) can support the exploration of emotions in particular with patients. We recall that CM is a technique for generating a written, organized, hierarchical representation of concepts and the relationships that associate them [18]. It permits a patient to express his/her knowledge and representations, and allows the caregiver to help refine these ideas [19]. However, in previous studies, we have noticed that the act of creating a concept map often elicits emotions in the patient without exploring them deeply [20]. Thus, in contrast with a technique such as photolanguage, mainly conceived to help patients verbalize their affects, we are interested in extending the technique of knowledge collection via concept mapping to the study of emotional states. Hopefully, this process will deepen our understanding of the emotional domain, which is known to be closely linked to cognition [11], and make it easier for caregivers to take emotions into account while intervening on the patient's knowledge base.

Therefore we propose to use the CM technique to "survey" the emotions of the patient, so that the patient and the caregiver can better identify these states. The emotion map can then serve as a baseline for the patient and the caregiver to observe the repercussions on the initial concept map (the knowledge and representations of the patient).

Aim of the study

This paper proposes a new technique to facilitate the study of patient emotions. The technique starts by generating a concept map from which the patient's emotions are expressed. The map can be read on two distinct yet interconnected levels: the knowledge domain (concepts and links) and the emotional domain (identification and characterization of the emotions). This exploratory study, based on preliminary experiments, attempts to determine the feasibility, advantages, and educational limitations of the *concept maps/emotion maps* (CM-EM) produced by adolescent patients.

2 Method

2.1 Population of the study: the adolescent patients

The health care services participating in this experiment were selected for the age range of their patients, their experience in TPE, and for their openness to educational research. For several reasons, we have chosen for this study a sample of adolescents. Adolescents are still very close to their primary emotions, which are not yet completely hidden behind mental elaborations (frustration, jealousy...) that obscure the real meaning of the feeling [12]. During this period, impulsiveness and emotional instability increase; all feelings are intensified. This change can lead adolescents to feel as if they were losing control of their emotions and behavior. In reaction, when faced with adults and caregivers, adolescents often greatly restrict their discourse and emotions: they hide their feelings because they feel fragile. This is the sense of the "lobster complex" described by Dolto [21]. These important transformations influence health behaviors (motivation to pursue treatment, refusing or abandoning treatment, conflicts with authority, loss of self-esteem) and complicate the approach to therapeutic education of these patients. Caught between the world of the child and the adults' world, adolescents are very sensitive to the educational approaches using games that create a space between the patient and his/her body in its illness. Drawing, a mode of expression favored by children [22], loses some of its interest during adolescence. In the proposed technique, the patient does not draw *per se*; he/her chooses a word representing an emotion from a list, then he/she uses colors and symbols to refine his/her feeling and its intensity. The visual symbols bypass barriers to the verbal expression of emotions that the adolescent is experiencing internally, especially when these emotions have a negative social connotation (fear, anger, sadness). The technique thereby attempts to bring a playful dimension to the adolescents, while accepting that most of the patients are reaching the end of their latency stage and beginning to make use of the formal logical reasoning described by J. Piaget [23].

In the end, 14 young adolescents were asked to participate in the study. One of them refused. Thirteen concept maps/emotional maps (CM-EMs) were created by 6 boys and 7 girls suffering from cystic fibrosis (10), diabetes (2), and asthma (1). Those with cystic fibrosis or diabetes were following a therapeutic education program in the city of Nantes. Only one of them was a "first patient", coming for his first therapeutic education consultation while receiving home treatment through the organization *Réseau Asthma 44*. Most of the patients had been receiving care for several years through a specialized service, and were coming to the hospital for outpatient consultations every term.

2.2 Elaboration of a concept map/emotion map (CM-EM)

As a first step, the researcher elaborates a concept map describing the patient's statements on a blank sheet following predefined rules [18]. The technique was explained to the patient beforehand, by creating a concept map on a topic of his choice. In the second step, the patient writes down emotions on a transparency placed over the concept map, thereby creating the concept map/emotion map (CM-EM). This map is elaborated with the help of an "emotion legend" guiding the patient in his/her choice and expression of emotions (Fig. 1). The legend is composed of items proposed to the patient, presented in chronological order. The "emotion legend" tool is developed from the basic emotions defined by P. Ekman [4] (joy, fear, sadness, anger, disgust, surprise). The symbols are designed to help the patients find and choose emotions that they can identify with, on the basis of media young people are likely to use and recognize (language from MSN communication media, SMS, social networks such as Facebook and MySpace, etc.). The patients are also given images with metaphorical content (sun/clouds as a metaphor for moods; heart with arrow/broken heart as a metaphor for affective feelings). In other words, the adolescents define, express, and transcribe symbols of their own choosing to represent their emotional states and attach them to the explicit knowledge that they had previously expressed. We present the symbols used in Figure 1.

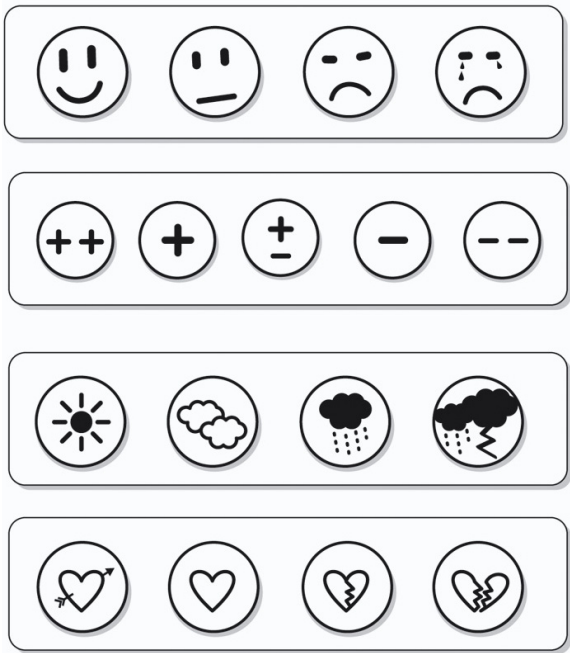

Figure 1. Symbols of the "emotion legend" tool.

- The "smiley faces" are used by the patient to express a happy, neutral, unsatisfied, or unhappy feeling.
- Quantitative signs ranging from ++ to – measure the intensity of an emotion felt by the patient. The adolescent can translate or qualify his/her experience as positive or negative, or as weak or intense. The patients may interpret these symbols in different ways, so it is important to specify their use with them. For example, the symbol "–" could signify either a negative perception of the event or the relative intensity of the emotion.

– Symbols such as the "weather" (sun, clouds, rain, storm) and the "heart" (transfixed heart, heart, cracked heart, broken heart) metaphors explore the tone of the feeling. It is supposed that depending on his/her age and gender, the patient will be more attracted to one representation or to another. The patients are free to choose the symbols that they identify with, and are invited to propose other symbols if they wish.
– Symbols are drawn by the patient on a transparency with markers of various colors (red, black, green, blue, orange, yellow, brown, violet).

By referencing familiar symbols, colors and metaphors, the "emotion legend" indirectly but explicitly accesses the emotional domain of the patient [24]. This creative and symbolic approach is heavily influenced by the works of B. Buzan and D. Goleman [25, 26]. As the CM-EM is being generated, the patient might be inspired to complete the initial concept map by more precisely defining previously expressed knowledge.

2.3 Pre-test of the concept map/emotion map (CM-EM)

An initial experiment with the technique was carried out on adults and children more than 10-year-old children, on subjects of their choice but having an emotional impact on their life. This step helped to refine the technique and to develop a pedagogical outline permitting caregivers to use it autonomously.

2.4 Conducting the interviews

After the patients have given their consent, the interviews took the form of an intimate dialog between the researcher and the young patient. A health care provider from the team was also present, but only to observe the process. Among the 13 interviews carried out, 12 were observed. Six observers participated in the study: 2 psychologists, 1 doctor, 2 nurses who were also TPE coordinators, and 1 pediatric nurse. Six interviews were observed by the psychologist, who was attached to the department caring for the cystic fibrosis patients. The remaining interviews were observed by the other professionals; the doctor observed two of them.

The parents were told the purpose of the interview, and after their consents were obtained, were asked to wait outside the room. One of the interviews was conducted in the presence of the mother, at the request of the patient. The department set aside a meeting room or patient bedroom in order to provide a calm setting for each interview. The sessions lasted between 25 and 45 min.

Following the interview, the adolescents were asked a series of questions about their opinion of the technique [27]: overall appreciation, impact and usefulness (approach, process), and the quality of support materials (graphics, symbols).

After each session, the observer's comments on the interview were also recorded in the absence of the patient.

2.5 Mode of analysis

The entire dataset (CM-EMs, patients' responses to the post-interview questions, and the comments of observers) was analyzed using a qualitative approach. We are mainly interested in how the emotion legend tool was used, in how the patients categorized concepts and emotions, and in the opinions expressed by all participants. The concept maps themselves were not analyzed in depth [18].

3 Results

To teach the principles of concept mapping and provide an initial example, the patients chose one of their favorite dishes as the central concept (*"white cheese with sugar"*, *"chocolate cake"*, *"pan cakes"*, *"rice"*, *"ham with mashed potatoes"*...). This introductory session established a relaxed climate, instilling confidence and alleviating any shyness or nervousness. After creating a concept map around an idea of their choice, all the patients agreed to continue the exercise. They were able to characterize their emotions autonomously. The process of developing a CM-EM is illustrated by the case of one patient (P11) (Fig. 2).

3.1 Analyzing the development of a concept map/emotion map

3.1.1 Emotions and colors

The adolescents did not hesitate over their choices of emotion and color. Table I shows the distributions of emotions and colors expressed by the patients. Five of the patients wanted to talk about other emotions in relation to the concepts in the CM. The entire list of concepts and associated emotions is presented in Table II. Two of the children thought that more emotions should have been provided. Both wanted to express something that didn't correspond to one of the suggested emotions, and could not find the words themselves. For example, one patient (P11) was trying to express his feeling of impotence with respect to the illness. He talked about a feeling similar to disgust when faced with the obligation to do something, having no other choice: *"the aerosol treatment"*. Another patient (P5) mentioned the *"disappointment"* he felt due to his illness. The associations between colors and smileys varied from one patient to the next.

3.1.2 The signs and symbols

Each adolescent spontaneously chose at least two of the proposed symbols. They easily drew a character or "smiley face" corresponding to their emotional state. Faces 2 (😐) and 3 (☹) were chosen more frequently than the others. Some patients suggested new symbols, such as an "angry face" or "disgusted face". Eight of them invented new symbols or modified existing ones, mainly representing a storm or anger. Figure 3 presents a few examples. Every patient chose a symbol from the weather series that characterized one of their emotional states (joy: sun; sadness: cloud/rain; anger: storm). Girls used

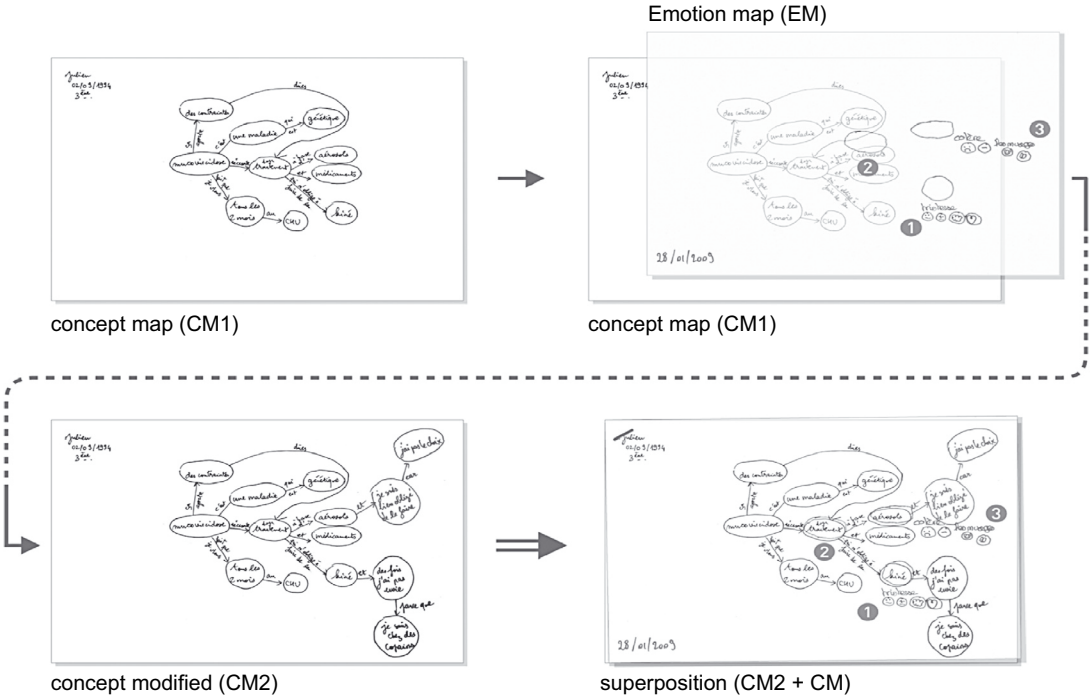

Figure 2. Elaboration of a Concept Map-Emotion Map (CM-EM)

Table I. Distribution of emotions and colors chosen by the adolescents (N = 13).

Emotions chosen by adolescents		Colors chosen by adolescents	
Anger	6	Blue	6
Joy	5	Red	6
Sadness	5	Pink	4
Fear	2	Yellow	3
Disgust	2	Black	3
Surprise	1	Brown	2
		Orange	2
		Green	1

the heart metaphor more often than boys. The signs ++ and – were used less frequently than + and –; no one chose +/– (Fig. 1).

3.1.3 Links between concepts and emotions

When the transparencies were positioned over the concept maps, some patients (6) wanted to add "emotional colors" to complement ideas in the concept map. Four of them preferred the caregiver to rewrite statements and relationships in the chosen colors. The other two continued their own work, rewriting statements on the concept map in color.

During elaboration of the concept maps, the initial or central concepts brought up by the patients in relation to their illness divide easily into four broad categories: treatment (*hospital*, *treatment*, *aerosols*, *physical therapy*, *shot*), illness (*sugar*, *lungs*, *diabetes*, *cystic fibrosis*, *coma*) and its psychosocial consequences (*taking part in sports*, *absence from school*), and finally external resources (*family*, *siblings*, *friends*, *others*, *the pet*, *relationships*). An analysis of all the CM-EMs is reported in Table I.

When they bring up an emotion in conversation, most of the adolescents want to link it to the secondary propositions expressed in the CM. Among the secondary concepts, some have strong negative connotations:

- biomedical concepts: the illness and its consequences, symptoms, treatments (*diet*, *enteral feeding*, *aerosols*, *physical therapy*);
- psychosocial concepts: personal feelings linked to the illness and its impact (*feeling down*, *hard to bear*, *sacrifice*, *too much*, *lots of medicine*).

Others have positive associations:

- quality of life (*eating*, *laughing with my sister*, *pony riding*);
- moral support from caregivers (*my physical therapist*, *the CRCM team*) and family (*the family*, *my sister*, *the dog*);
- hope (*a miracle*, *maybe one day*).

Some reactions are particularly striking:

- rage at their lack of control over the illness, and at the obstacles it creates in their social life (*missing school*, *some sports are forbidden*, *impossible to play with the dog*);
- sadness that they have to accept the illness and its consequences;
- joy at having a strong support network (*parents*, *siblings*, *friends*), good therapeutic relationships with the caregivers

Table II. Concepts selected by adolescents and their relationships with emotions.

Patient	Disease	Age	Gender	First concept chosen (CM)	Emotions emotion (CM-EM)	Secondary concept linked to emotion (CM-EM)
1	Cystis fibrosis	15	F	Treatment	Anger	Sacrifice – it exhausts me quickly
2	Cystis fibrosis	14	M	Absences from school	Anger	Asthma – gastrotomy
3	Cystis fibrosis	13	M	My family	Joy	Support me – his presence – even if I had nothing
4	Cystis fibrosis	13	F	Patients associations	Joy	Nutrition
5	Cystis fibrosis	14	M	Cystis fibrosis	Sadness	Ill
6	Cystis fibrosis	11	F	Do some sports	Sadness	Coughing – enteral feeding – are not much bigger
7	Asthma	11	M	The dog	Anger	Lung – sibling – mother tell me to play less with it – it has got mite
8	Cystis fibrosis	12	F	Other people	Disgust	A lot of treatment – ill – glycemia
9	Diabetes	15	F	My sister diabetes	Joy (1) Disgust (2)	
10	Cystis fibrosis	15	F	Friends	Joy (1) Fear (2)	(1) Hospital doctors – my physical therapist (2) Hospital – the blues
11	Cystis fibrosis	14	F	Aeorsols Physical therapy	Anger (1) Sadness (2)	(1) Treatment
12	Cystis fibrosis	12	F	Hospital lungs	Anger (1) Sadness (2) Joy (3)	(1) Physical therapist – aerosols – treatment – taking of blood – radiographic (2) Illnes – hard to support – pancreas (3) Perhaps miracle one day
13	Diabetes	11	M	Coma Shot Sugar	Fear(1) Anger (2) Sadness (3)	(2) Too much

CM: concept map. CM-EM: concept map-emotion map. (1) (2) (3) Order of expression for emotion.

(*my physical therapist*, *the CHU teams*), or hope for a cure (*working with non-profit organizations*, *miracle*);
- the disgust one can feel at one's own body and its illness(*infectious context*, *the reactions and fears of others...*) or at treatments linked to blood, organs, etc.;
- fear that the illness will have serious consequences (*coma*).

3.2 Opinions of the adolescents regarding the technique

Generally speaking, all the children appreciated the time they spent in the interview. When asked about their favorite part (concept mapping or expressing their emotions), 3 said they liked both, 6 preferred choosing and applying colors, and 2 liked talking about concepts that evoked positive memories. All the patients enjoyed creating the concept map, 3 of them strongly. The CM-EM helped them become aware of their knowledge and their feelings regarding the illness: *"People get ill"*; *"I didn't know I could think so much about CF"*. Everyone, without exception, appreciated the time dedicated to emotions (*"It showed me what I was feeling"*) and above all being able to draw and play with the colors. The patients were asked to suggest a name for the second part of the process. Among their ideas were *"emotional map"* (5), *"emotion map"* (2), *"extraordinary map"*, and *"galaxy"* (1). On the other hand, when asked, most of the patients (11) did not think that the technique gave them any new information or encouraged them to change things in their life. However, after expressing his anger, one boy said that he finally understood why his treatment wasn't progressing: *"it helped me understand why the aerosols bug me so much..."* Most of the patients (10) wanted to take the map home with them. Only one of them didn't want to go through the exercise again. Almost all of them (12) wanted to talk about something in the next session, although they couldn't say exactly what: *"it depends on how I'm feeling at the moment"*. One adolescent wanted to talk about diabetes, a secondary illness she had just been diagnosed with but which she didn't bring up during the interview: *"Let's continue what we were doing and talk about something else: diabetes, another illness."* They didn't have any suggestions for improving the technique, aside from changes to the graphics and symbols (adding new symbols such as an "angry face", a "disgusted face", or a storm with lightning bolts). To

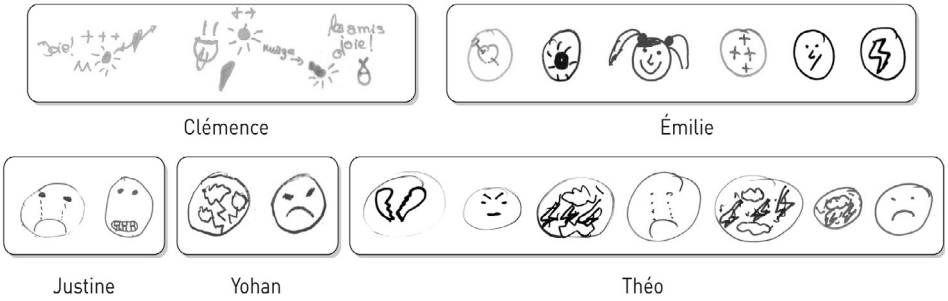

Figure 3. Some symbols created by the adolescents.

the question "Was there anything you didn't like?" everyone responded *"No."* No matter their age, everyone felt confident and at ease, sufficiently secure for the technique to be applied.

3.3 The observers' comments

All the observers recognized that the technique *"could get adolescents to bring to light the anger or revulsion that they wouldn't have expressed otherwise"*. Even those who were most skeptical at the beginning manifested interest, particularly with respect to the emotion map: *"After observing the process, I think I'd like to try the emotion map myself one day"*, *"It's not easy to access one's emotions, especially emotions such as anger and sadness which are difficult to express socially. We train children from infancy to control their anger and hide their sadness, to the point where it becomes difficult to 'tell' these emotions at all."* All the observers found the technique very interesting in relation to their favored mode of interaction: *"It allows us to have a rich discussion, in sync with the patient's emotions about his illness."* Some felt they got to know their patient better: *"The caregiver can discover that his patient is not as dull as he seems, without questioning him."* Most of them felt comfortable with the technique after their first observing session. Each observer imagined ways of using the technique for education in their own practice. For example, according to the psychologist *"The emotion map opens another door to the emotions, thanks to its 'visual' aspect. This 'front door' will encourage dialog, meaningful exchanges on the emotions, in a very interesting psychiatric session."* The doctor said *"It permits us to react more precisely to the needs of the patient, with respect to treatments for example, if they are a source of anger."*

The observers also discussed limitations of the technique and its indicators. The limitations concern neither the objective nor the capacity of the method to collect data on emotions, but rather the need for training and pedagogical guidelines for those who wish to use the method in their practice. They also raised the question of whether a caregiver will be able to accept the emotions of the patient: *"Each caregiver will have to explore the representations and feel at ease with them, without difficulty, from the very beginning. They should either feel perfectly at ease, or else avoid using the method."* Finally, they raised the ethical question of patient confidentiality: *"What we're doing might violate the principle of confidentiality: what does the team do with the maps and their possible analysis? If a psychologist uses the method, are they to be kept secret? This needs to be worked on."*

4 Discussion

4.1 Pedagogical uses of the CM-EM technique

Even more than the original idea of an emotion map, the CM-EM offers young patients a new way of expressing their emotions through colors and symbols. By stimulating creativity, the CM-EM provides a window onto the complex emotional domain and supports the adolescent's expression. It also facilitates dialog with the patient, easing fears brought on by the illness or home treatment. The "emotithat pathat pathat pathat pathat pathat pathat pathat pathat pathat pathat paon legend" tool likewise makes it easy for patients to access their emotithat pathat pathat pathat pathat pathat pathat pathat pathat pathat pathat pathat pathat pathat paonthat pas: the graphics are easy to draw and modify so that the patient need not fear reproducing them badly. The colors bring another useful dimension to the map. Colors are being used more and more in alternative therapies (chromotherapy for example). From infancy, colors provide children with a clear choice and opportunities for play and activities like drawing. [8]. The fact that patients can apply the colors themselves, choosing the ones that correspond to their emotions, is in itself a therapeutic act.

Each CM-EM is the creation of an adolescent who has agreed to report his/her emotions on a given subject. In the literature, one analysis of statements by hospitalized children aged 6–12 year old reports that emotions are revealed in each discourse [28]. Fear seems to be the most common emotion expressed by these hospitalized children: fear of pain, of treatment, of the unknown, of the place, of death, of abandonment. However, A. Tcherkassof (2008) has shown that an intercultural dimension clothes the emotions and calls into question the universality of their significance [3]. An emotion doesn't mean the same thing to all people; for example, tears don't always signify pain. In our study, the adolescents don't express the same emotions when talking about their illness; some feel sadness, some anger, and others even joy. Only one adolescent mentioned fear directly. When choosing from the proposed signs and symbols, the results of this study also showed

significant variation from one patient to the next: no two will express what they feel in the same fashion. For example, the extremes (++, −, ☺ and ☹) are the least often chosen ones. This might suggest that the patients are distancing themselves from strong emotions, and that they express themselves accordingly, as well as revealing the great subjectivity of emotion when comparing individuals. Also, it is not possible to draw general conclusions on the meaning of the emotions raised. As stated by B. Rimé, it is in the process of social sharing that emotional experiences receive intersubjective validation [2]. This casts the fundamental role of the caregiver-educator in a new light: by welcoming and recognizing a patient's emotions, her/she takes on his/her full value for the subject.

The CM-EM encourages a closer interaction between emotion and cognition. The process of creating a CM-EM appears to be more mature, deliberate, and natural for the 14 and 15 year old than the youngest. These patients have more highly developed metacognitive faculties. In fact, they also have more to say about the usefulness of the technique itself.

These facts are evident when we consider the 11–12-year-old patients. Children gradually acquire logic from the stage of concrete operations: they know how to explain the causes and effects of treatment, as well as those of their illness. They are cable to enrich their own thinking with conclusions or the ideas from others. Their discourse attests to a growing intellectual curiosity and to an interest in existential questions, both of which come with the development of moral and ethical standards. There is a seriousness in their statements that seems to take into account the heavy social and cultural values linked to the hospital, the illness, and the treatment. This process of cognitive development is nearly complete by the age of 15 [29]. The example of Figure 1 illustrates this idea well: after having expressed his anger, he finally understood why he was refusing treatment. We can imagine that through this exercise, this 14-year-old boy realized why he became so annoyed at each aerosol treatment. Creating the CM-EM enabled him to make the connection between his refusal to accept the treatment and his emotion. This situation confirms that this method of "alternative expression" allows adolescents to move from a symbolic emotion to verbal expression. The affect, when vocalized, can become an object of thought in itself [22]. Once this step has been made, it is easier to intervene in, regulate, and reorganize the patient's knowledge domain. The CM-EM technique permits caregivers to more widely explore an adolescent's knowledge and representations of his or her illness, by way of the emotional dimension. In the same way, the CM-EM also will encourage the adolescent to complete or modify his/her concept map.

4.2 Words of warning and perspectives on using the CM-EM technique

Generally speaking, interviews are still a favored technique in the human and social sciences. Although frequently associated with other research techniques such as observation, interviews are the only way we can learn and understand the psychosocial factors related to experiencing illness. This gives the method considerable strength and legitimacy [30]. However, it has its limitations: ambiguities and the social desirability of the person being interviewed. As Kolhberg [31] emphasizes in his model of moral education, the child adapts his discourse to the observer; during an interview he will say what is expected of him, or what he thinks is expected from him. Another difficulty resides in how the caregiver-educator interprets the patient's statements. The interviewer might not assign the right significance to words and ideas rose by the patient, and could even understand the opposite of what is meant. This is all the more true when speaking of illness and suffering, which restructure the affective and cognitive universe of the patient. These ideas will be related in very particular terms, which are not always accessible to the listener [29]. To handle this, the caregiver-educators must constantly adjust their understanding, and provoke reactions in the subject to confirm their interpretations.

All these limitations revealed themselves during this first experiment with the CM-CE, and so care is required on many levels when interpreting the results. However, the visual and collaborative properties of the CM-EM constitute a means of limiting the number of possible interpretations for each interview. Indeed, by attributing emotions to concepts and groups of concepts, it is possible to explicitly question the patient on their associations. In addition, the maps give the caregiver-educator a good framework to help the patient enrich his or her concept map. The point is not to explore the emotional domain independently of the cognitive domain, thereby using the CM-EM in other ways than its intended purpose. The point is to draw connections between concepts and emotions to strengthen the knowledge organization of the patient.

Further study is necessary to confirm the pedagogical usefulness of the CM-EM technique, its consequential or social validity as defined by Messick [32]. We are considering the extension of the experiments to other age ranges and other types of subjects (children, adults, parents, spouses). The need for such research was clearly expressed by the caregiver-educators who participated in the study. The psychologist who observed the interviews supports this idea: "[...] *only those of a certain age will be comfortable with this tool, maybe 7- to 8-year-old... We have also observed that adolescents eagerly accept it and take pleasure in the activity, so I wonder whether it would also be suitable for adults.*" Even now, other research is confirming the usefulness of concept maps in accompanying the education of 8- to 13-year-old diabetic patients [20]. Concept maps have been used with children 4 to 5-year-old, after adapting the technique to their stage of psychomotor development [20]. In this exploratory study, we noted differences in the metaphors chosen according to gender and culture: 75% of boys did not identify with the heart metaphor, and the only foreign patient did not choose any metaphors at all. In a wider study or one with more patients, it would doubtless be necessary to propose metaphorical symbols and graphics adapted to different ages and cultures [2, 24].

This first experiment raises new questions that forthcoming research should be able to explore. Presuming that future studies confirm the feasibility of the CM-EM technique, yet others should respond to the following questions. What are the

effects of this technique on the cognitive structure of the patient, as revealed by the concept map? What modifications are observed in the nature and organization of the knowledge in the concept map after exploring the emotions of the patient? To what extent is learning encouraged by making connections between concepts and emotions?

5 Conclusion

By enriching the concept map with an exploration of associated emotions, the CM-EM technique opens new perspectives in the therapeutic education of the patient. The CM-EM is a sort of "mental and emotional photograph" of the patient, which permits a caregiver-educator trained in its use to build an educational relationship and promote learning by the patient. The technique simultaneously explores the patient's cognitive and emotional states, and is useful at several points during the educational process. The simple and creative process of generating a CM-EM enlightens the patient as to the emotions and feelings raised by their illness, and also lets the caregiver know the nature and intensity of these emotions. Further study is necessary to explore the potential of the CM-EM technique. In particular, it would be interesting to find out whether it actually establishes new relationships between the concepts chosen by the patient and the emotions they report. Does the connection actually modify the knowledge construct of the patient? Or does the technique simply mediate between the patient and the caregiver, encouraging a dialog centered on the worries of the patient?

References

1. D'Ivernois JF, Gagnayre R. Apprendre à éduquer le patient, Approche pédagogique. 2e éd. Paris: Maloine; 2005, 155 p.
2. Rimé B. Le partage social des émotions. Coll. Psychologie Sociale, Paris: Presses Universitaires de France; 2005, 420 p.
3. Tcherkassof A. Les émotions et leurs expressions. Presses Universitaires de Grenoble; 2008, 134 p.
4. Ekman P. An argument for basic emotion. Cognition and emotion 1992; 6:169–200.
5. Lacroix A, Assal JP. L'Education thérapeutique des patients. Nouvelles approches de la maladie chronique. 2e éd. Paris: Maloine; 2003, 208 p.
6. Iguenane J, Gagnayre R. L'éducation thérapeutique du patient – Le diagnostic éducatif. Kinésithérapie, Les cahiers 2004; 29–30:58–64.
7. Sensky T, Catalan J. Asking patients about their treatment. Br Med J 1992; 305:1109–1110.
8. Klein JP. L'art-thérapie, avenir de la médecine? Que sais-je? Presses Paris: Universitaires de France 2001, 128 p.
9. Haenni C, Anzules C, Assal E, Malavia M, Assal JP, Golay A. Programme Art et thérapie dans les soins: une nouvelle approche pour le suivi de nos patients. Médecine et Hygiène 2004; 2484:1134–1136.
10. HAS, INPES. Structuration d'un programme d'éducation thérapeutique du patient dans le champ des maladies chroniques. Guide méthodologique. HAS; 2007, p. 53-63. Disponible sur : http://www.has-sante.fr/
11. Pellecchia A, Gagnayre R. Entre cognition et émotion : les potentialités de l'art dans l'éducation thérapeutique. Pédagogie Médicale 2006; 7: 101-109.
12. Damasio AR. Le sentiment même de soi – Corps, émotions, conscience. Paris: Odile Jacob-Sciences; 1999, 358 p.
13. Giordan A. Apprendre ! Collection Débats, Paris: Belin; 2005, 254 p.
14. Pelican J. Maladie chroniques : l'éducation du patient enfant passe par le jeu. La santé de l'homme 2006; 385:8–10.
15. Juré E, Iguenane J, Toudounou A, Azondecon A, Gagnayre R. Utilité du génogramme dans l'éducation thérapeutique : une étude exploratoire auprès de parents d'enfants vivant avec le VIH/sida au Bénin. Santé publique, 2010; 22:11–22.
16. Franca S, Marchand C, Craplet C, Basdevant A, d'Ivernois JF. Application of "Concept Mapping" in obese subjects: a pilot study in normo and underreporters. Diabetes Metab 2003; 29:72–78.
17. Marchand C, Poitou C, Pinosa C, Harry I, Basdevant A, d'Ivernois JF. Using concept maps to describe the evolution in obese patients' knowledge and expectations following bariatric surgery. Educ Ther Patient/Ther Patient Educ 2009; 1:49–55.
18. Marchand C, D'Ivernois JF, Assal JP, Slama G, Hivon R. An analysis, using concept mapping, of diabetic patients' knowledge, before and after patient education. Med Teach 2002; 24:90–99.
19. Deccache A, Libion F, Mossiat F, Cuvelier MC, Gagnayre R. Paired comparisons of role représentations among patients and nurses in Belgian chronic disease care units. Educ Ther Patient/Ther Patient Educ 2009; 1(2):S127–S133.
20. Pinosa C, Marchand C, Tubiana-Rufi N, Gagnayre R, Albano MG., d'Ivernois JF. The use of concept mapping to enlighten the knowledge networks of diabetic children: a pilot study. Diabetes Metab 2004; 30:527-534.
21. Dolto F. Paroles d'adolescents. Paris: Gallimard Jeunesse; 1989.
22. Anzieu A , Barbey L, Bernard-Nez J, Daymas S. Le travail du dessin en psychothérapie de l'enfant. Paris: Dunod; 2002.
23. Piaget J. La représentation du monde chez l'enfant. 6e ed. Paris: PUF; 1991.
24. Kirouac G. Cognition et émotion. Coimbra; Imprensa da Universidade de Coimbra; 2004.
25. Buzan T, Buzan B. Dessine-moi l'intelligence. Les éditions d'organisation; 1996, p. 153–164.
26. Goleman D. L'intelligence émotionnelle 2, cultiver ses émotions pour s'épanouir dans son travail. Ed Robert Laffont; 2003, p. 296–337.
27. Lemonier F, Bottéro J, Vincent I, Feron C. Outils d'intervention en éducation pour la santé : critères de qualité. Collection Référentiels de bonnes pratiques. « Grille des outils d'intervention en éducation pour la santé », Saint-Denis: Edition INPES; 2005, p. 53–63.
28. Ribes ML. Comment les enfants voient-ils l'hôpital? Le Journal des Professionnels de l'enfance Septembre/octobre 2005; 25–29.
29. Golse B. Le développement affectif et intellectuel de l'enfant. 3e éd. Médecine et Psychothérapie. Masson; 1994, 303 p.
30. Fischer GN, Tarquinio C. Les concepts fondamentaux de la psychologie de la santé. Paris: Dunod; 2006, 268 p.
31. Kohlberg L. The Development of Modes of Thinking and Choices in Years 10 to 16. Ph.D. University of Chicago, 1958.
32. Messick S. The once and future issues of validity: assessing the meaning and consequences of measurement. In: Test validity. New Jersey: LEA Publisher; 1988, p. 33–46.