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Case Report

Therapeutic Use of Auto-Induced Cognitive Trance in a Chronic Pain Setting: A Case Study Using Mixed Methodology

Gaëtan Collignon [1, †], Aminata Bicego [2, 3, †, *], Marie-Elisabeth Faymonville [2, 4], Olivia Gosseries [2, 5, 6], Vincent Bonhomme [7, 8, 9], Dominique Dive [10], Corine Sombrun [11], Antoine Bioy [1, §], Audrey Vanhaudenhuyse [2, 7, §, *]

1. Laboratory Psychopathology and Change Processes, Paris 8 University, St Denis, France; E-Mails: gaetan.collignon@univparis8.fr; antoine.bioy@univ-paris8.fr
2. Conscious Care Lab, GIGA Consciousness, Liège University, Liège, Belgium; E-Mails: abicego@uliege.be; bicego.am@gmail.com; mfaymonville@chuliege.be; ogosseries@uliege.be; avanhaudenhuyse@chuliege.be
3. Cognitive Psychology Unit, Social Sciences Faculty, Leiden University, Leiden, The Netherlands
4. Arsène Burny Center, Liège University Hospital, Liège, Belgium
5. Coma Science Group, GIGA Consciousness, Liège University, Liège, Belgium
6. Centre du Cerveau, Liège University Hospital, Liège, Belgium
7. Interdisciplinary Algology Center, Liège University Hospital, Liège, Belgium; E-Mail: Vincent.Bonhomme@chuliege.be
8. Anesthesia and Perioperative Neuroscience Laboratory, GIGA Consciousness, Liège University, Liège, Belgium
9. Department of Anesthesia and Intensive Care Medicine, Liège University Hospital, Liège, Belgium
10. Clinical Neuroimmunology Unit, Department of Neurology, Liège University Hospital, Liège, Belgium; E-Mail: Dominique.Dive@chuliege.be
11. Trance Science Research Institute, Paris, France; E-Mail: sombrun.c@trancescience.org

† These authors contributed equally.

§ These authors coordinated equally.

* **Correspondences:** Aminata Bicego and Audrey Vanhaudenhuyse; E-Mails: abicego@uliege.be; bicego.am@gmail.com; avanhaudenhuyse@chuliege.be

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Abstract

Auto-induced cognitive trance (AICT) is a method for voluntarily entering modified state of consciousness. The therapeutic implications of AICT are still unknown. Since complementary approaches based on modified states of consciousness are recognized to be beneficial for patients suffering from chronic pain (e.g., hypnosis, meditation), we here present the first case report of a 68-year-old man with a long history of chronic pain linked to an open Spina Bifida L4-L5, who used AICT to improve his health condition. Standardized questionnaires were collected before and after four days of AICT training. In addition, testimonies of AICT practice were recorded in his diary for 2 months post-training. Data were analyzed through a mixed methodology using textual statistical analyses, thematic content analysis, and a narrative approach based on clinical psychology. The results showed that, after AICT training, pain intensity, anxiety, and depression slightly decreased; most of the attitudes and beliefs evolved positively; the mental component of quality of life was improved, while the physical component decreased, and the patient considered that his global condition of health had worsened. Narratives allowed deeper comprehension of the patient's experience of AICT and its effect on his health. Qualitative analysis using textual statistical analysis revealed four classes related to 1. corporality and trance characteristics; 2. location of pain, AICT action, vocalization, and daily life; 3. questioning, difficulties in the practice of AICT, AICT characteristics and the tension felt and expressed during AICT; and 4. medical and somatic elements. Finally, five themes were identified using thematic content analysis, i.e., 1. AICT; 2. medical history; 3. pain, falls, and motor difficulties; 4. professional activity and private life; 5. thoughts and reflections. Altogether, these qualitative reports allow for the characterization of the subjective experience of the patient regarding his health condition and his way of dealing with pain.

Keywords

Trance; auto-induced cognitive trance; modified state of consciousness; pain; chronic pain; therapeutic option

1. Introduction

Pain, as taught to healthcare professionals, is considered a warning symptom, an alarm signaling the patient to question whether the pain threatens the body's integrity. When the pain intensifies, the patient consults a physician to identify and treat the underlying cause. This approach aligns with the traditional biomedical model, which is well-suited for addressing acute pain. However, in some cases, pain can become chronic, lasting more than 3 months beyond the expected healing period of tissue pathology [1]. Therefore, the patient faces an entirely different situation since pain loses its

function as a warning signal and becomes a condition in its own right. This experience of chronic pain significantly reduces the patient's autonomy and disrupts their daily life, adversely affecting self-esteem and personal identity. Its persistent nature also progressively diminishes self-confidence and the ability to assert oneself. Over time, this often initiates a self-perpetuating cycle: patients withdraw from occupational and social activities, engage less in physical movement, and develop physical deconditioning. This reduction in activity fosters increased attention to bodily sensations, resulting in hyperawareness of physical symptoms. Consequently, this heightened focus can lead to increased anxiety regarding the interpretation of these sensations, frequently accompanied by stress, sleep disturbances, fatigue, irritability, and feelings of discouragement [2-4]. The management of chronic pain continues to present a significant challenge for the medical and scientific communities. Commonly used analgesic medications include non-steroidal anti-inflammatory drugs (NSAIDs), antidepressants, antiepileptics, paracetamol, weak and strong opioids, and various adjuvants. However, these treatments often show limited efficacy, pose risks of adverse effects, and carry the potential for misuse and dependency [5]. Years ago, a large European study highlighted that 40% of individuals with chronic pain were dissatisfied with their prescribed treatments [6]. In response to these challenges and to minimize associated risks, there is growing interest in complementary approaches for managing both acute and chronic pain. In recent years, it has become increasingly clear that non-pharmacological approaches, based on the biopsychosocial model, improve the quality of life of patients suffering from chronic pain [5, 7-9].

Auto-induced cognitive trance (AICT) is a voluntary modified state of consciousness developed by one of the co-authors (C.S.) who has been trained in traditional shamanic Mongolian communities. AICT is induced via vocalizations and body movements but lacks shamanic ritual context [10-12]. During 4 days of formal training, participants are taught to self-induce the AICT by listening to specific sound loops and then by identifying individualized movements and/or vocalizations that trigger AICT [13]. Pioneer studies on AICT practitioners show that AICT induces several phenomenological characteristics such as expression of intense, modification of perceptions, feelings of unicity, an altered sense of self, feelings of absorption and dissociation, expansion of consciousness, enhanced inner imagery, increased creativity, visions of entities and/or places, modified somatosensory processing, and a loss of time-space cues [10-12, 14]. On a more embodied level, AICT can lead to motor automatisms, vocalizations, and body movements. In addition, the phenomenological experience related to participants' free recall after an AICT is characterized by the presence of animals, nature features, and body perception, a decrease of thoughts related to metacognition, as well as more incredible difficulty in describing thoughts when compared with ordinary states of consciousness [15]. Finally, preliminary works suggest that AICT has singular neurophysiological characteristics that distinguish it from the ordinary state of consciousness [10, 16, 17] and other trance practices such as hypnosis and meditation [18].

Currently, the literature concerning the therapeutic and clinical value of trance practices inherited from ancestral traditions is poor [19, 20]. However, a growing number of patients are turning to non-pharmacological approaches, including techniques inspired by the shamanic tradition [21]. Beyond shamanic practices, complementary approaches in general are being increasingly utilized and accepted by patients across Western Countries. Notably, individuals with chronic pain are more likely to rely on complementary techniques, including mind-body therapies like hypnosis, compared to patients with other chronic conditions such as depression, respiratory issues, or diabetes [22].

Given that AICT modulates emotion and body perception and has been subjectively reported to modify pain perception [14, 16], AICT should be considered a potentially valuable approach in managing clinical conditions such as chronic pain.

In this first case report, we analyze the subjective experience of AICT in a patient suffering from chronic pain by using a "first-person approach" [23]. The richness of his story and his ability to make sense of his experience provide hints to understanding AICT's role in managing chronic pain. The mixed methodology (i.e., a combination of textual statistical analysis [24], thematic content analysis [25], and narrative approaches based on clinical psychology [26]) delves into individual and subjective characteristics to use AICT in the chronic pain context. Whereas empirical studies such as randomized controlled trials provide objectivity to whether a therapeutic method is effective for a given symptom, qualitative studies offer insights into the processes of change that may be at work in a person using such a therapeutic modality, in this case, AICT. In addition, how these data are collected places the subjects in the position of experts, who can best report on their apprehension of the phenomenon [27]. Since this paper is the first of its kind, no a priori hypothesis was given.

2. Materials and Methods

2.1 Participant and Training

The patient is a 68-year-old man, married, of Western culture, atheist, and without any meditative practices at the time of his inclusion in this study. He suffers from chronic pain linked to an open Spina Bifida L4-L5 and S1 associated with a cauda equina malformation and scoliosis. Surgery was done on day 3 post-birth to close the open dura. The patient needed several surgeries due to recurrent fistulae. The patient is a French speaker, and all data were collected in French.

The description of AICT training was previously published in [12, 14, 17, 18]. Briefly, AICT training encompasses a system of techniques based on sound loops composed of binaural sounds with pure tones between 100 Hz and 200 Hz and beat rates lower than 10 Hz combined with serial music sequences and voice recordings, developed by one of the co-authors (C.S.). At first, the sound loops are used as a means for participants to enter into AICT. The sounds are supposed to lead to automatic body movements or vocalizations, which are considered to be able to induce AICT. Once the trigger is identified by the participants, they are invited to self-induce the trance by only relying on their personalized trigger, without the sound loops. The training consists of two 2-day workshops, with a 2 week interval, in groups of around 20 participants. Participants are then allowed to continue practicing autonomously at home. The patient participated in the entire training program.

The study was approved by the Ethics Committee of the Medical School of the University of Liège, Belgium (internal reference number: 2015/85). Before participating in the study, the patient was fully informed about the study's objectives and provided written consent. No incentives were offered.

2.2 Procedure

Before participating in the first 2-day workshop, the patient was invited to complete various questionnaires related to his sociodemographic, beliefs about AICT and his chronic pain condition. The same questionnaires and additional ones regarding AICT were completed after the second 2-day workshop (i.e., after 14 days).

In addition to these questionnaires, the patient spontaneously kept a diary for almost two months, in which he wrote all his experiences related to his AICT learning, and its use in the context of chronic pain. This material, collected in a non-directive way, enabled us to describe his mental states, experiences and difficulties accurately. Additional data were also provided, which were not directly included in the analysis. Still, they may help to put the narratives into perspective: a letter addressed to his doctor, audio recordings of trances (vocalizations), and pictorial works produced during the diary period.

French versions of the following questionnaires were used:

- *Medical and sociodemographic* information such as sex, age, educational level (i.e., higher degree obtained), occupational status, diagnosis of chronic pain, and pain duration.
- *Pain* was assessed using a numerical rating scales (NRS) ranging from 0 (no pain) to 10 (pain as intense as you could imagine) [28].
- *Anxiety* and *depression* were evaluated with the Hospital Anxiety and Depression Scale (HADS). The HADS is a 14-item self-report screening that contains two 7-item subscales for anxiety and depression, with a total score for each ranging from 0 to 21. The higher the score, the greater the symptoms [29].
- *Beliefs towards pain* were examined using the Survey of Pain Attitude-35 (SOPA-35). This scale consists of seven subscales, each measuring a specific pain-related belief. The harm subscale evaluates the belief that pain equates to physical injury. Disability measures the belief that pain results in disability. Medication assesses the belief that medication is the best pain treatment. Solicitude gauges the belief that others are responsible for helping one manage their pain. Emotion measures the belief that emotions affect the pain experience. Medical cure evaluates the belief that a doctor must relieve pain. Control assesses how much control one believes they have over their pain experience. Each subscale has a specific scoring system, where a higher score indicates a stronger endorsement of the belief [30].
- *Quality of life* was evaluated with the Short Form-36 (SF-36). This scale consists of 36 items divided into eight subscales, which generate two summary scores: mental component summary (MCS) and physical component summary (PCS). Higher scores on these summaries indicate better psychological and physical quality of life [31].
- The *perception of change* attributed to the AICT was assessed using the Patient's Global Impression of Change (PGIC). The PGIC is a single-item scale assessed through a 7-point scale. The higher the score, the worse the improvement [32].

2.3 Data Processing

Questionnaire scores were described and reported in a table to illustrate the patient's self-assessed evolution.

Textual statistical analysis methods are lexicometric tools that use words as statistically analyzable entities. The software used to perform this analysis is IRaMuTeQ [33]. In particular, this software enables Correspondence Factorial Analysis (CFA). This data analysis method factorizes occurrences and thus creates a polarization between "lexical worlds", as proposed by Reinert's CFA-based method for classifying word occurrences according to organized themes [34]. We thus submitted our corpus (patient's diary) to the Reinert method, with the classification mode "simple on text segment". The classes obtained were analyzed based on the χ^2 (degree of dependence of

the word about the class) and the significance of each word. This software also allowed us to obtain the most characteristic text segments of the class that we used to understand what the classes represent. We also used similarity analysis [35] to analyze the co-occurrences of words to establish graphs to understand the links between words. On these graphs, edges appear that connect the words; the thickness of these edges indicates the importance of the co-occurrence index. The co-occurrence indices obtained by the analysis of our corpus vary from 1 (weak co-occurrence between two words) to 12 (strong co-occurrence between two words). We thus focused on the words connected by a co-occurrence index of 8 or higher. Words are then grouped into "word communities" representing standard co-occurrence links between words.

Thematic content analysis is a qualitative method used in the humanities and social sciences for its ability to describe the themes present in a corpus. It consists in the development, a priori or by constituting it during corpus analysis, of a coding grid enabling a thematic reading of the content [36]. Given the exploratory nature of our study and the non-directive nature of the corpus, we opted for a bottom-up, inductive coding approach, which develops a coding grid from the text without any preconceived categories. The patient's entire diary was manually coded by 2 experimenters (G.C., A.B.) by unity of meaning (often corresponding to sentences or segments of sentences) to obtain categories, which we then grouped into the main themes. These themes could then be described based on the verbatims contained in each category.

The third tool is based on a clinical psychology approach, precisely the *narrative approach* [37]. The goal of clinical psychology is to hypothesize about people's psychological functioning, based on the subjective elements reported and the way subjects make sense of their experience. The narrative approach links this to their life story, and how experiences evolve. For the patient's case, we thus linked the responses to the questionnaires, the textual statistical analyses and the thematic content analysis, with the elements we had of the patient's life story to hypothesize about the psychological mechanisms at work for him through AICT.

3. Results

3.1 Questionnaires

All results are summarized in Table 1.

Table 1 Questionnaire scores before and after both AICT workshops. NA: non-applicable.

	Before training	**After training**
Questionnaires (min-max)		
Pain intensity, VAS*, 0-10*		
	9	8
HADS, 0-21		
Anxiety	11	10
Depression	13	11
SOPA35, 0-20		
Control	1.4	0.6
Disability	3.2	3.2
Harm	2.2	3.2

Emotion	1.8	2.6
Medication	4	2.2
Solicitude	1.4	1
Medical cure	2.6	1
SF-36, 0-100		
Mental component	32.20	35.95
Physical component	40.65	36.55
PGIC, 1-7		
	NA	2

Pain intensity decreased from before to after the training.

Anxiety and depression were reduced from before to after the training, going from "moderate" scores (between 11 and 15) to “light”, as they were ≤11 after AICT training. The patient’s answers to this questionnaire allow us to specify the evolution, with improvement in 4 out of 14 items. The patient worries "quite often" after AICT training, whereas he used to worry "very often". After training, he never felt frightened and never had a knot in his stomach, whereas this happened "sometimes" before; he "often" enjoys a good book or a radio or TV program, whereas he used to enjoy them "sometimes"; and he takes more pleasure "in the same things as before" (from "not as much" to "a bit more"). For 2 other items, responses show a decrease in pleasure after AICT (from "much less than before" to "almost never" for the item "I look forward to doing certain things"), and an increase in sudden feelings of panic (from "not very often" before to "quite often" after). Responses to the other 8 items remained unchanged.

Beliefs towards pain were modified after the training. Control, medication, solicitude and medical cure subscale scores decreased after training, while the scores of harm and emotion subscales increased. The disability subscale’s score remained unchanged.

While the *mental quality of life* increased after the training, the *physical* component decreased.

After the training, the patient reported that his health worsened as assessed with the *PGIC* questionnaire.

3.2 Textual Statistical Analysis

The diary comprises 19 first-person narratives, in which the patient transcribes his experiences. Among these 19 narratives, 14 were related to the AICT experience, while five were related to the descriptions of daily life. The corpus of 19 texts, is made up of 6024 occurrences (i.e., the number of words in the corpus); 1399 forms (each aspect of a word, i.e., “suffer” and “suffering” is a different form), including 818 "hapax" (i.e., words appearing only once in the corpus). The words appearing most frequently in the corpus are represented in Figure 1, in which the size is proportional to their frequency.

Figure 1 Forms (i.e., words) retrieved for the textual statistical analysis, associated with the AICT experience. AICT: auto-induced cognitive trance.

The corpus (including the 19 narratives) is composed of 4 classes. The first class, includes elements linked to corporality and trance characteristics, with a positive valence (e.g., pleasure). The characteristic text segments of this class (in relative ranking) are related to this link between trance and body: “A form of release for my body, which becomes more flexible. I can't break free from the trance; every time I try to escape it, it draws me back in.” (relative score = 23.08); “At the center of what, in fact? At the center of life, of vital energy, the trance leads me imperceptibly to re-experience my body but also to rethink it.” (relative score = 23.08) The most representative words of the class are "body" ($\chi^2 = 33.5$, $p < 0.0001$), “power” ($\chi^2 = 18.97$, $p < 0.0001$), “pleasure” ($\chi^2 = 16.55$, $p < 0.0001$), “trance” ($\chi^2 = 12.66$, $p < 0.001$), “voice” ($\chi^2 = 12.21$, $p < 0.001$), and “find” ($\chi^2 = 12.21$, $p < 0.001$).

The second class, hierarchically linked to the first, is more descriptive. It provides information on the location of pain and AICT’s action (e.g., «on the left leg»), the type of vocalization (e.g., singing), and elements of daily life. The most representative words of this class are “left” ($\chi^2 = 23.71$, $p < 0.0001$), “leg” ($\chi^2 = 16.92$, $p < 0.0001$), and “edge” ($\chi^2 = 14.08$, $p < 0.001$).

The third class refers to questioning, difficulties in the practice of AICT in daily life, characteristics of the AICT state and the tension felt and expressed in AICT through "musical supplications" (i.e., a type of music that combines a request or prayer with emotional and poetic expression). The most representative words of this class are “question” ($\chi^2 = 20.66$, $p < 0.0001$), “state” ($\chi^2 = 20.66$, $p < 0.0001$), “stage” ($\chi^2 = 14.51$, $p = 0.00013$), “part” ($\chi^2 = 14.51$, $p < 0.001$) and “fight” ($\chi^2 = 14.51$, $p < 0.001$). The most characteristic text segments of this class (in absolute ranking) are “I listen to the musical supplication and I start the AICT already in a trance state. I become fully aware that my trances were a part of these musical supplications” (absolute score = 88.39). These first three classes form a hierarchical whole, which we understand to be linked to the patient’s experiences, particularly the phenomenology of trance.

The fourth class relates to medical and somatic elements, as well as to falls, pain, various medical professionals and examinations. The most representative words of this class are “fall” ($\chi^2 = 30.85$, $p < 0.0001$), “doctor” ($\chi^2 = 23.57$, $p < 0.0001$), “MRI” ($\chi^2 = 16.55$, $p < 0.0001$), “neurological” ($\chi^2 = 16.55$, $p < 0.0001$) and “hip” ($\chi^2 = 16.55$, $p < 0.0001$).

Similarities analysis applied to the entire corpus (i.e., 19 narratives) revealed statistically related word communities as shown in Figure 2. This graph represents the links between words, based on their co-occurrences, grouped into "word communities" (the different colors). The central word community is related to the “trance”, a word mainly linked to the word "pain" (co-occurrence index = 12) and the word "body" (index = 9). A high index is also present between the words pain and fall (index = 8), between "leg" and "left" (index = 8).

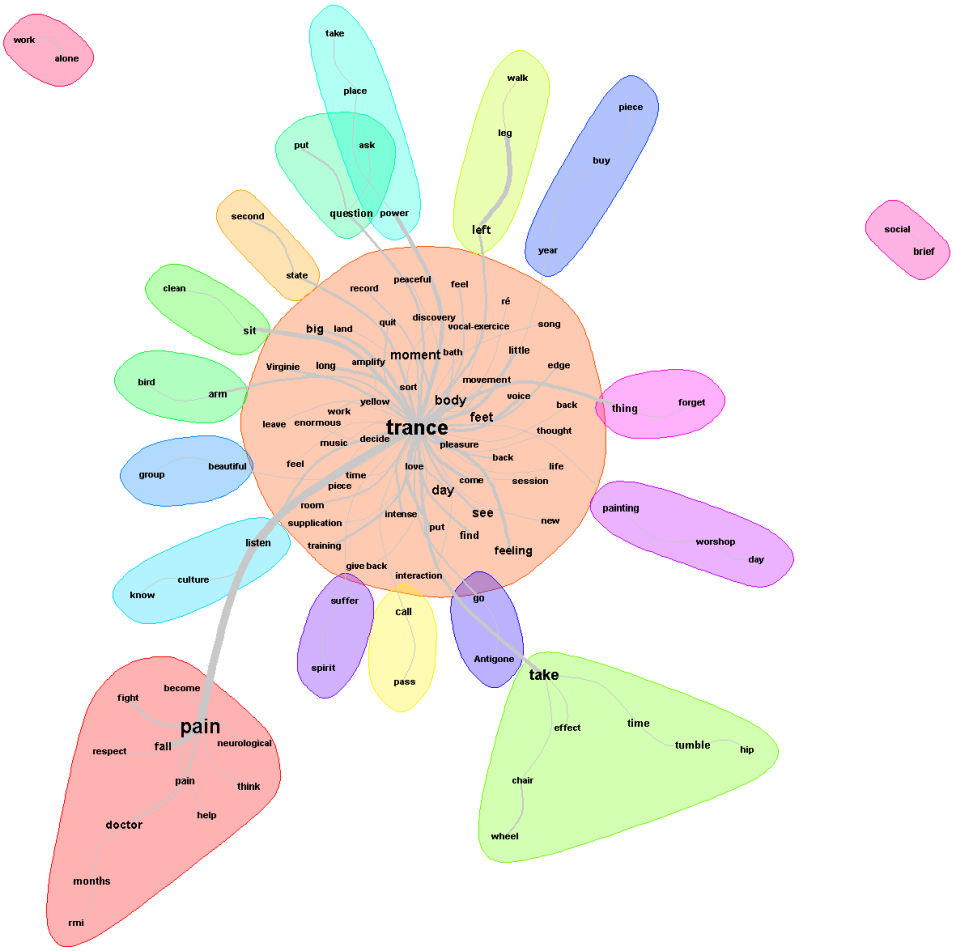

Figure 2 Similarity analysis applied to the entire corpus (i.e., the 19 narratives). The width of the lines represents the strength of the link between the two forms (co-occurrence index, range 1-low to 12-high). Word communities are represented by different colors and correspond to groups of words with a common link with a central word (which does not mean that the link between these words is stronger than the link with words outside the community). The size of the words is proportional to the number of occurrences in the corpus (e.g., the word trance appears 112 times, and the word pain 48).

3.3 Thematic Content Analysis (TCA)

From the 19 narratives, we identified 5 themes (Figure 3), ranked by importance in the corpus: 1. AICT; 2. Medical history; 3. Pain, falls, and motor difficulties; 4. Professional activity and private life; 5. Thoughts and reflections. The themes and the categories they contain can then be linked to one another.

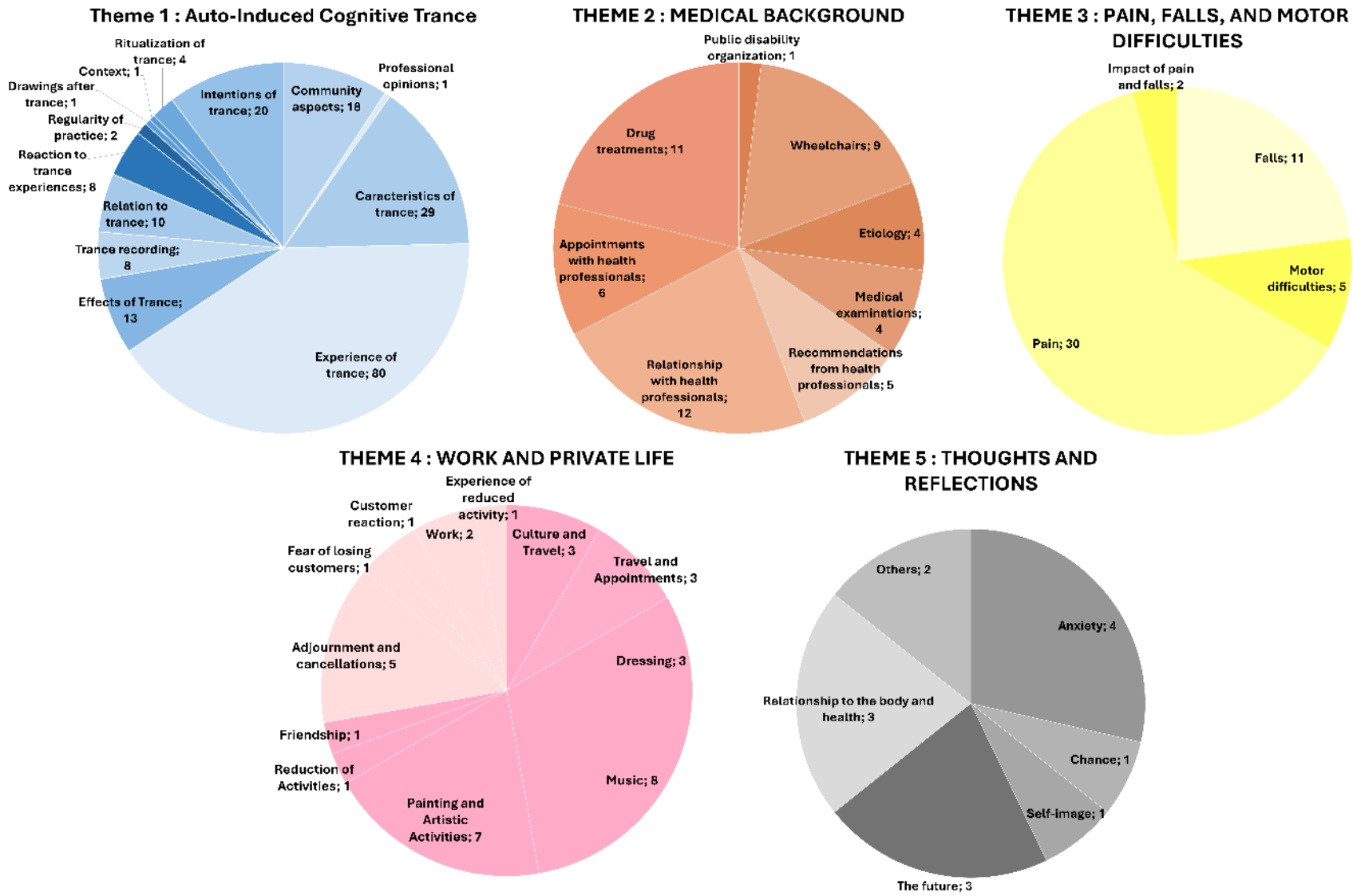

Figure 3 Hierarchical diagram of the categories according to different themes.

The first theme (AICT), which accounts for 54.01% of the references in the corpus, enables us to describe trance experiences, their characteristics, and their effects. It also provides information on the intentions behind trances, community aspects, and the patient's relationship with the trance.

The second (medical history) and third themes (pain, falls and motor difficulties) deal with medical aspects (14.4%) and the patient's somatic feelings (13.3%). They provide information on the patient's treatment and care by various health professionals, and descriptions of his pain, falls and motor difficulties, as well as the impact of his physical problems.

The fourth theme (professional activity and private life) is the patient's personal (7.2%) and professional (2.77%) activities. The patient is a person who, despite his pain, has kept up a professional activity, which he is gradually being forced to reduce. In his diary, he also expresses personal aspects relating to his hobbies (painting, music), his daily life, and his private relationships.

Finally, in the fifth theme (thoughts and reflections), the patient discusses his thoughts on various subjects (4.16%): his relationship with his body and health (unlike theme 3 where the patient describes his somatic sensations, here he expresses his feelings towards his body and health), chance, his anxiety, his questions about the future, and his self-image.

4. Discussion

Due to a pathology, the patient has been suffering from chronic pain for many years. Thanks to questionnaires and narratives provided, we were able to show that, after AICT training, pain intensity, anxiety, and depression slightly decreased; most of the attitudes and beliefs positively evolved; the mental component of quality of life was improved, while the physical component decreased; and the patient considered that his global condition of health has worsened. Narratives allowed a deeper comprehension of the patient's experience of AICT and its effect on his health condition (Figure 4). Qualitative analysis revealed 4 classes related to (I) corporality and trance characteristics, (II) location of pain, AICT action, vocalization, and daily life, (III) questioning, difficulties in the practice of AICT, AICT characteristics and the tension felt and expressed during AICT, and (IV) medical and somatic elements. Finally, five themes were identified with the TCA, i.e., AICT; medical history, pain, falls and motor difficulties; professional activity and private life; thoughts and reflections. Altogether these qualitative reports allow us to characterize the internal/subjective experience of the patient regarding his health condition and his way of dealing with pain, as will be discussed below.

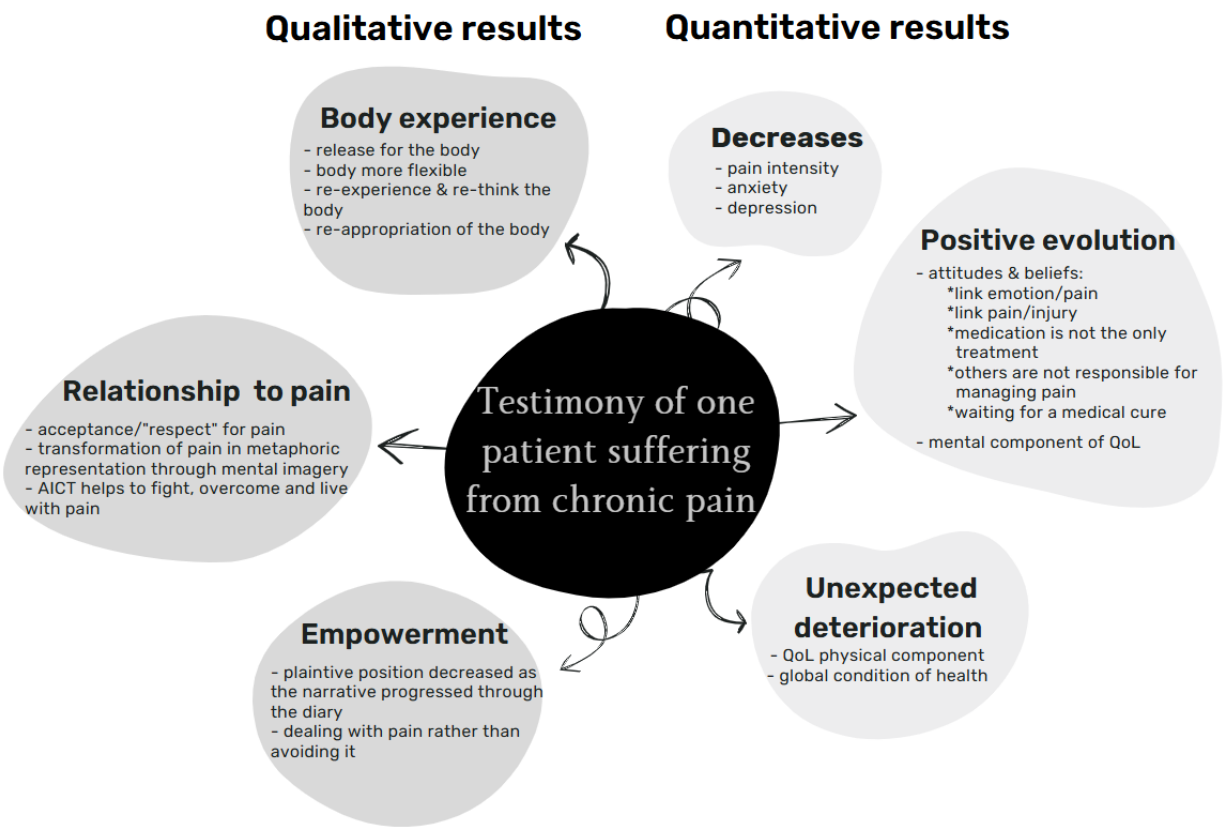

Figure 4 Summary of the qualitative and quantitative results based on the testimony of one case report patient suffering from chronic pain, after auto-induced cognitive trance (AICT) training. QoL: quality of life.

Before the training, the patient's pain intensity was assessed at 9/10, and 8/10 right after. In his account, the patient relates that, during AICT, the AICT may have had a relieving effect ("I felt that the trance brought me some relief from the pain"; "I believe that the trance has an effect on my "original pain"). In addition, it seems that the patient's relationship to pain changes as the diary progresses. That might be linked to emotional regulation, reflected in decreased anxiety and depression scores as well as increased scores in the belief that emotion impacts pain. We can, therefore, hypothesize that these positive changes are directly related to the impression of a better mental quality of life. Whereas at the beginning of the diary, numerous complaints about the pain are present, the narrative becomes tinged with acceptance, even "*respect*" for the pain, showing the passage from a passive, plaintive position to one of integration of the painful experience as part of oneself. In the "AICT effect" theme extracted with the thematic content analysis (Figure 3), we find verbatims such as "The trance has just taught me that I must respect my pain. Phenomenal discovery", and "I've hated and feared this pain for so many years. Respect shouldn't stop me from fighting it. Respect doesn't mean submission or resignation". AICT appears at several points as a mediator of pain: it seems to enable the patient to experience his painful body in a metaphorical form. For example, in one of his trances, the patient had a mental image that spontaneously appeared in his daily life in which he saw "a descent from the cross", which he interprets as "I feeling that I must capture/absorb all the suffering and pain of the world to overcome my own and fight the evil spirit that makes me suffer". This visualization echoes his difficulty walking, which he describes as an "ordeal". AICT thus seems to help the patient to successfully experience his aching

body instead of avoiding pain. This is reflected at the end of his diary, through several intentions that the patient defined before inducing AICT, such as "Trance help me to fight pain; help me to overcome pain; help me to soothe pain; help me to overcome or content my evil genius of pain; help me to respect my pain; help me to live with this pain". Our observations corroborate previous case reports and studies conducted with patients suffering from chronic pain and having benefitted from shamanic-based approaches [38-42]. These studies, although encompassing small samples with several method limitations, have reported that patients' testimonials included decreased pain sensation and increased feeling of calm, improved sleep quality, and enhanced quality of life. Other qualitative studies conducted with patients suffering from chronic pain also reported these benefits for pain and emotional regulation after using modified states of consciousness-based approaches (e.g., hypnosis, meditation) [43-46].

An important phenomenological element the patient relates in his narratives is the bodily mobilization experienced during AICT. In particular, he explains involuntary movements and contractions, which are described as "protective" ("movements, more precisely contractions, of the left leg, without excess, protective") or life-giving ("life comes back to me timidly in this dead, suffering, painful leg"). The painful, hard-to-move body outlined in his everyday life seems to be able to free itself during AICT: "a kind of liberation of my body, suppler, as if hardened". AICT enables the patient to rediscover what is possible: "I didn't know I was capable of this movement, or else it was so long ago that I'd lost the memory of it. No, this movement is modest, but new". Precisely and paradoxically, the pain is most often localized where the movements are felt (in the left leg): "During this trance, as my left foot beat time, I felt a kind of tension, muscular or nervous? In the lateral side of my left calf. A tension that was unknown to me (I wish it were) or no longer known to me". The body is thus fully experienced during trance, and goes into action: it feels (vibrations), moves and sings, as reported by the patient in his diary. The AICT experience was also strongly marked by the vocalizations produced by the patient. Vocalizations are diverse in form and character: "powerful", "pleading", "windy noises", "light and subtle" and are described in positive terms: "a very captivating, beautiful song"; "my own voice and proto-languages that I have cherished and diversified since discovering trance"; as a way of re-appropriating his body, which becomes a musical instrument: "the pleasure of sound and vibrations that make my body a musical instrument". The body seems thus closely linked to AICT, as was shown in the analysis of similarities (Figure 2). The occurrence of the word "power", related to both the word "body" and the word "trance", shows the intensity that trance can have in its bodily aspect.

It seems that AICT also affected the beliefs and attitudes that the patient has towards pain. A first observation is that, after AICT training, the patient's SOPA questionnaire scores indicate that his beliefs that medication is an appropriate treatment for pain and beliefs in a medical cure were decreased. In addition, at the beginning of his diary, the patient reported being mainly preoccupied with finding a causal link, an etiology to his pain. In particular, he wonders whether the pain causes the falls, or vice versa. The patient seems to believe that there is a single answer, a cure. After AICT training, a significant theme emerges from the narratives, which corresponds to class 3 found with the textual analysis, as well as in the "thoughts and reflections" theme (Figure 3): an internal questioning, which could be described as a "struggle", a word the patient uses to explain some of these trance experiences. This hesitant, questioning aspect is a tipping point between, on the one hand, the medical, an external action linked to the environment, and on the other hand, the internal world, an action that starts from the patient and is mainly found in the first class. This questioning,

which can be linked to the action of trance, tends towards a questioning of the omnipotence of the nursing environment reported in his narratives. This hypothesis could correspond with the lower scores on medication and medical cure SOPA scores in favor of the empowerment of the patient, who becomes aware of his fragilities and accepts them as he uses AICT. However, we should notice that the control subscale on the SOPA slightly decreased after AICT training. This decrease is not concord with the previous observation of a potential empowerment increase reported in the patient's narratives. In addition, most studies have reported that this control subscale increased after non-pharmacological approaches, such as self-hypnosis/self-compassion [47, 48]. One study assessing the impact of self-hypnosis/self-compassion found a decrease in the control subscale after the intervention [49]. These last results can be explained by the participant's reasonable control over pain presented at the beginning of the study. This was not the case for the patient in this case study. These observations highlight the importance of studying the psychology and development of individuals not only by relying on quantitative data such as questionnaires, but in combination with a narrative approach as highlighted in our previous study [49]. This allows a deeper understanding of the subjective experience of people.

One limitation of this study is that we cannot generalize our results to the population of patients suffering from chronic pain. Future controlled studies on a larger sample are needed to establish the effect of AICT on the global health of patients with chronic pain. In addition, these future studies should include middle and long-term assessments of the health of these patients, since here we only have short-term observations. Finally, we should also investigate the specific effects of this technique: are the observed outcomes exclusive to AICT, or are they similar to those obtained with other approaches based on a modified state of consciousness (e.g., hypnosis, meditation)?

5. Conclusion

This case study provides insight into the processes involved in a patient’s journey to overcome his chronic pain by learning AICT. In particular, we have highlighted the change in his bodily experience, which the patient sums up by saying that "trance timidly puts my body back into motion, while this very body lets go of me."; the evolution of his relationship with pain, which the patient learns to "consider" and "respect," and the transition from a passive position, particularly about care, to empowerment, leading the patient to care for himself. Through this case study, analyzing quantitative and qualitative data, we can understand the potential benefits of AICT in managing chronic pain. Future studies are expected to explore these benefits in large samples, randomized-controlled studies relying on mixed methods. These protocols will allow a better understanding of the benefit of integrating trance-based techniques into patient healthcare by drawing on the experiences of other patients.

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Author Contributions

Conceptualization and methodology: A.V.; investigation: A.V.; formal analysis, G.C., A.B., A.B. and A.V.; validation: all authors; resources: all authors; writing-original draft preparation: G.C., A.B., A.V.; writing-review and editing: all authors; supervision: A.V.; project administration: A.V., A.B., O.G.; funding acquisition, A.V., O.G. All authors have read and agreed to the published version of the manuscript.

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Competing Interests

C.S. is the founder of the TranceScience Research Institute.

Data Availability Statement

The data is available on request to the corresponding authors.

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