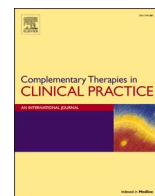




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# The influence of psychosocial factors on the intention to incorporate complementary and integrative medicine into psychiatric clinical practices

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## ABSTRACT

Complementary and integrative medicine (CIM) can be of great support to individuals suffering from psychiatric conditions; however, it is still rarely incorporated into clinical practice.

**Objective:** To examine the influences of psychosocial and sociodemographic factors on health-care professionals' intention to use CIM in their psychiatric clinical practice.

**Method:** One-hundred-and-five participants completed a questionnaire developed from an adapted version of Triandis' Theory of Interpersonal Behavior (TIB). Intentions to use CIM (yes or no) were analyzed using logistic regression models.

**Results:** The multivariate model retained three main factors: affect, perceived social norms, and conditions facilitating CIM. These predicted health-care professionals' intention to use CIM with an AUC = 94.7%.

**Results:** underlined that positive affective attitudes towards CIM, feeling that CIM was congruent with professional and institutional goals, and having sufficient skills in CIM were essential to ensuring that health-care professionals would integrate CIM into their clinical practice.

## 1. Introduction

Mental health disorders represent one of the largest parts of the global burden of disease [1–3]. One study showed that almost one in five adults (17.6%) had suffered from a common mental disorder in the past 12 months and that 29.2% had suffered from one in their lifetime [1]. Mental disorders cause acute suffering and significant loss of autonomy [4]. Indeed, they are the principal cause of disability globally, generating significant social and financial costs [2,5]. These illnesses also impact the social environment, with a risk of secondary psychological difficulties among family and friends [6,7], which may lead to increased feelings of loneliness [8,9]. Thus, mental health patients often suffer a significant reduction in their quality of life [4,6]. These multiple problems, in addition to the potential side effects of medication, such as weight gain and a decreased libido [10], can reduce medication adherence [11]. The complexity of the situations that patients with mental illnesses find themselves in, however, requires combined approaches to care [3,12]. Associating non-medicinal and

pharmacological approaches is common [13].

Indeed, this may explain why it is relatively common for psychiatric patients in Western societies to use complementary and integrative medicine (CIM) to supplement conventional treatments [3]. As its use is rising worldwide [14–16], it is estimated that 16%–44% of people with mental illness also use CIM [17]. Indeed, 78.3% of people with a 12-month DSM-IV disorder and using complementary and alternative medicine reported being 'satisfied/very satisfied' with it [3]. CIM is recognized as improving individuals' physical and emotional well-being, with more than 96% of patients who use it perceiving benefits [18]. Integrative medicine is defined as the coordinated and selective incorporation of elements of complementary and alternative medicine into standard medical treatment plans derived from conventional diagnostic methods [19,20]. CIM approaches include diverse beliefs and practices, such as spiritual therapies, products derived from plants, animals, or minerals, manipulation-based techniques, and exercises, none of which are generally considered part of conventional medicine [16,20,21].

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Providing psychosocial, person-centered care [22] is essential to avoid the dramatic consequences of mental illnesses in terms of stigmatization, social isolation, and reduced quality of life [12,23–25]. Many health-care professionals perceive CIM as a useful tool for supporting psychiatric patients, one which can contribute to person-centered care [26–28]. Indeed, CIM has become an unavoidable part of psychiatric clinical practice [3]. This trend is in line with the WHO’s Traditional Medicine Strategy, which aims to promote a broader vision of care, targeting improved health, person-centered care, and the development of patient autonomy through the high-quality, safe, and effective practice of CIM [16,21]. Despite all these benefits, CIM is not invariably incorporated into clinical practices; incorporation is very heterogeneous, depending on the hospital unit or medical specialty [29]. In the French-speaking part of Switzerland, 50% of hospitals have indicated that they offered at least one complementary and alternative medicine therapy [30]. One third of hospitals in Denmark offer CIM [31]. That rises to 64.4% in Norway, where no major differences were found between somatic and psychiatric hospitals [32].

Health-care professionals in somatic units face various barriers to integrating CIM, and their use of it depends on several types of factors [27,28,33–36]. This also may explain why its use varies considerably from one health specialty or hospital unit to another [16,29]. Given patients’ and health-care professionals’ growing interest in CIM as part of routine psychiatric treatments, describing and understanding the multiple factors affecting whether health-care professionals are able to incorporate CIM into their clinical practice seems essential. To the best of our knowledge, no studies to date have examined the factors explaining health-care professionals’ use of CIM in psychiatric hospital settings based on the psychosocial factors in the Triandis’ Theory of Interpersonal Behavior (TIB). Furthermore, the role of sociodemographic factors remains little-studied even though it is known that they can influence the integration of CIM into professional health-care practices. Improved knowledge in these areas will provide a better understanding of what encourages professionals to integrate CIM into psychiatric health-care.

## 2. Theoretical framework

According to the literature, adopting a new professional behavior depends on a wide range of psychosocial factors [37,38]. Triandis’ original TIB [39] explored cultural, social, and moral elements to create a better understanding of behaviors involving personal or ethical responsibilities during the development of new clinical practices in psychiatry, such as CIM [40], which was not yet a part of standard treatment and practice [35].

In the TIB, the adoption of a specific human behavior is facilitated by the three direct antecedents of habit, intention, and conditions. Habit and intention vary according to the novelty of the behavior being studied. The strength of intention is critical when a behavior is new, whereas the strength of habit increases with the degree of automatism that may result from the behavior’s repeated performance. We considered *past behavior* instead of *habit* because incorporating CIM into clinical psychiatric practice is not yet the standard professional clinical practice expected within institutions. *Habit* corresponds to the frequency with which a behavior has been adopted in the past, and some studies have indicated that this might explain 7.2% of the variance in intention [41]. *Facilitating conditions* are elements that might aid or impede a behavior. Previous studies using the TIB found that the factors of *habit* and *facilitating conditions* were directly related to intention and thus were important predictors of intention [42], even though the original TIB model conceptualized them as the direct antecedents of behavior [39]. The *intention* to adopt a new behavior depends on several factors: *perceived consequences*, *affect*, *perceived social norms* (including both *normative beliefs* and *perceived social roles*), and *personal normative beliefs*. *Perceived consequences* are the result of a subjective, personal cognitive analysis of consequences as the advantages or disadvantages which

might result from a specific behavior [40]. *Affect* represents an individual’s emotional responses to the adoption of a new behavior. These responses result from the person’s previous experiences; they involve long-term memory and generate positive or negative feelings that will lead to psychological states that the individual will seek to reinforce if positive or stop if negative [40]. *Perceived social norms* are composed of two sub-components. The first sub-component corresponds to *normative beliefs*, as defined by Fishbein and Ajzen [40,43]. These result from a personal subjective analysis of the opinions of individuals or groups that the individual considers important with regard to the behavior being studied. The second sub-component corresponds to a *perceived social role* representing a personal assessment of the relevance of adopting or not adopting a new behavior in relation to one’s reference group. These norms differ according to the prevailing norms of societies and social groups. *Personal normative beliefs* result from a personal assessment of the relevance of adopting a behavior according to one’s values and principles and, therefore, from the obligation that a person feels to adopt this behavior [40]. The person no longer refers to the opinions of others, as these would be social norms.

Some authors have added other factors to the original TIB to study health-care professionals’ behaviors because the specificities of contexts and situations may influence the adoption of a new professional behavior [44,45]. One systematic review reported that *descriptive norms* explained an extra 5% of the variance in intention [46] and seemed to constitute a statistically significant determinant of behavior. *Descriptive norms* are respondents’ perceptions about the adoption of a particular behavior by other individuals. The factor of *self-identity*—which is not in the original TIB model—had a negative strength in the prediction of intention ( $\beta = -0.33$ ) in Gagnon’s study [44]. *Self-identity* is the degree of similarity between an individual’s perception of themselves and the characteristics that they associate with a particular behavior. Indeed, health-care professionals could perceive the use of CIM in clinical practice to be either positive or negative, especially with regard to energy medicines, which they are frequently skeptical about [47]. Sociodemographic variables were also included, such as type of health-care profession, sex, and the number of years of professional experience. These, too, are considered to influence professionals’ intentions to use CIM [35,44].

## 3. Study objectives

Based on an adapted TIB model (Fig. 1), the present study aimed to determine the influences of psychosocial factors (*perceived social norms*,

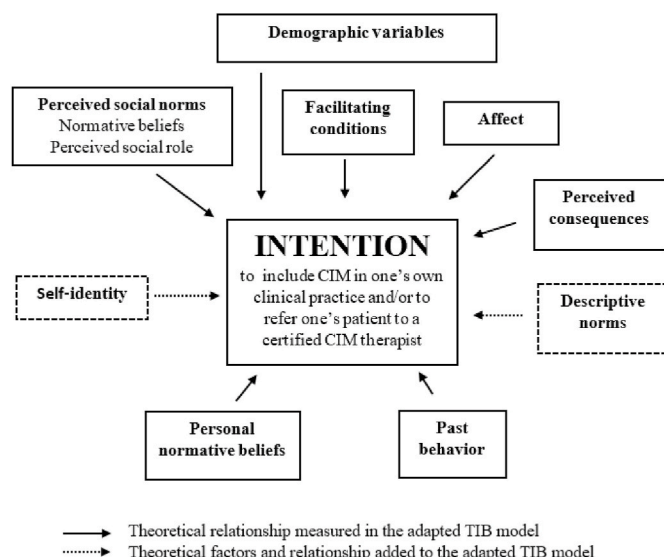


Fig. 1. Adapted TIB model, factors, and theoretical relationships.

facilitating conditions, affect, perceived consequences, descriptive norms, past behavior, personal normative beliefs, self-identity) and sociodemographic factors on health-care professionals' intention to use CIM in their psychiatric clinical practice with adults.

## 4. Method

### 4.1. Study population

This study was conducted in the French-speaking part of Switzerland among general practitioners (GPs), nurses, and paramedical staff (physiotherapists, occupational therapists, psychologists, and social workers) working in Lausanne University Hospital's northern Vaud psychiatric care units. The focus group and the interviews took place from April to May 2018. The survey took place from February to March 2019 through a self-administered questionnaire sent by email. Email addresses were provided by northern Vaud's psychiatric care units.

### 4.2. Ethics

The study's nature and purposes were explained in an email sent to both its focus group participants and the survey participants before the administration of the online questionnaire. By participating in a focus group or filling out the questionnaire, respondents gave implicit voluntary consent to their study participation. All the data were coded to protect anonymity and confidentiality. The Human Research Ethics Committee of the Canton of Vaud validated the study (no. 2018-00518) with respect to all the rules applicable to research on human beings.

### 4.3. Instrument development process

The instrument was developed following a mixed qualitative and quantitative approach [48].

#### 4.3.1. Item generation

Questionnaire items were generated using a qualitative approach [48]. We led two 1-h focus groups and six individual interviews with participants representative of the target population. The focus groups and interviewees were asked identical open questions, with the aim of drawing out as many of their beliefs about CIM as possible, covering each of the factors in the adapted TIB model (Fig. 1.) Audio recordings of each discussion and interview were transcribed verbatim. Two researchers then independently made a qualitative analysis of the transcriptions based on the factors in the adapted TIB model. They agreed on the labeling and classification of the themes extracted from the transcripts and summarized them to establish the content of the phase 2 questionnaire. Only topics addressed by at least two participants were retained.

#### 4.3.2. Content validity

To ensure content validity, the questionnaire's preliminary version was individually presented to eight experts from the target population and two experts on questionnaires; minor modifications were made to standardize and clarify item wording. The TIB questionnaire validation process was conducted using a sample of 22 health-care professionals with an almost identical profile to that of the target population (GPs, nurses, and paramedical staff working in Lausanne University Hospital's psychiatric care units, but not in northern Vaud). Participants were asked to take the questionnaire twice, with a two-week interval. The questionnaire's test-retest reliability was assessed statistically using Cohen's kappa. Results indicated good construct-reliability, with kappas averaging 0.75 and ranging from 0.4 to 1, indicating moderate to almost perfect agreement.

### 4.4. Instrument

In its introduction, the questionnaire defined CIM and the behavior being studied. CIM was defined as "A set of diagnostic and therapeutic methods (including natural health products) which are neither readily accepted by the current medical system nor taught in recognized medical schools. They can be classified into three broad categories of treatments: 1. Natural biological products (phytotherapy, essential oils, dietary supplements, homoeopathy, aromatherapy, etc.); 2. Mind-body interventions (acupuncture, reflexology, auriculotherapy, hypnosis, mindfulness, relaxing massages, sophrology, cardiac coherence, Eye Movement Desensitization and Reprocessing (EMDR), art therapies such as music therapy); 3. Other health-care approaches from traditional medicine (e.g., traditional Chinese medicine). The following validated, non-medicinal treatments do not fit into the definition of CIM: hygiene and dietary rules (dietary regime, physical activities and sports, modifications to eating habits, hygiene rules); usual psychological treatments (psychoanalysis, cognitive behavioral therapy, systemic therapy); physical therapeutics (rehabilitation techniques, physiotherapy, occupational therapy)."

The studied behavior was described as "The behavior (*incorporating CIM into my usual clinical practice with psychiatric patients*) refers to the act of administering CIM to patients yourself or referring them to somebody trained in CIM as a complement to the usual psychiatric care provided."

The questionnaire's introductory section was then followed by sociodemographic and professional questions.

Sociodemographic and professional characteristics were assessed using eleven questions inquiring about the respondents' age, sex, profession (GP, nurse, etc.), whether they were parents, whether they practiced in inpatient or outpatient care settings, whether they held a management position, whether they worked full-time or part-time, how many years of professional experience they had, whether they had used CIM in their clinical practice in the past, whether they had undergone recognized training in CIM by Lausanne University Hospital, and whether they used CIM in their personal life.

Participants were asked to indicate the extent to which they agreed with the item statements related to the factors of the TIB and the independent variable of intention based on the initial TIB model (see Fig. 1). Respondents then answered questions using either a 5-point Likert scale, a 7-point Likert scale, or a 5-point semantic scale related to the adapted factors of the TIB and the independent variable of *intention*. The factor of *past behavior* used 1 item with 4 response options (all factors and *intention* are detailed in Table 1). All the factor score calculations were the sums of their items.

### 4.5. Administration of the instrument to participants

The survey was distributed to all the 197 health-care professionals working in northern Vaud's psychiatric care units—66 GPs (33%), 82 nurses (40%), and 49 paramedical staff (27%)—of whom 122 began the questionnaire and 105 fully completed it (53%). All the data were coded to ensure confidentiality in REDCap software.

The survey was distributed electronically using REDCap software's electronic data capture tools and was hosted on servers at the University of Applied Sciences and Arts Western Switzerland [49,50]. Three to five reminder emails were sent to participants who had not yet completed the questionnaire. Participants were asked to indicate the extent to which they agreed with the item statements related to the TIB's different factors and the independent variable of intention (see Fig. 1).

### 4.6. The principal component analysis process

A principal component analysis (PCA) was performed to assess how appropriate each of the observed variables was with regards to the latent constructs they were supposed to measure, and to try to reduce the number of items, if possible. The first step assessed the data's

**Table 1**  
**Description and psychometric properties of the post-PCA questionnaire based on the TIB** (note that the English translations displayed below have not been validated per se).

TIB variables	Likert scale	Cronbach's $\alpha$
<p><b>Perceived social norms, measured using 5 items<sup>d</sup></b>                      Content for <i>Perceived social role</i>:                      “Incorporating CIM into my usual practice of care for psychiatric patients is part of my professional role.”                      Content for <i>Normative beliefs</i>:                      “In general: 1) my health-care team (including physicians) would approve of me incorporating CIM into my clinical practice; 2) my colleagues (practicing the same profession) would approve of me incorporating CIM into my clinical practice; 3) my institution would approve of me incorporating CIM into my clinical practice; 4) my direct supervisor would approve of me incorporating CIM into my clinical practice.”</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.89
<p><b>Conditions facilitating CIM<sup>a</sup>, measured using 3 items<sup>e</sup></b>                      “I would incorporate CIM into my usual clinical practice with psychiatric patients: 1) if I had good knowledge of CIM; 2) if my institution offered training in CIM; 3) if it was easy to get access to professionals trained in CIM and recognized by my institution.”</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.84
<p><b>Affect, measured using 5 items</b>                      Pairs of adjectives used after the phrase:                      “I think that incorporating CIM into my usual clinical practice with psychiatric patients would be ...”</p>	7-point semantic scale ranging from 1 (very negative emotion) to 7 (very positive emotion): 1) worrying–not worrying 2) uncomfortable–comfortable 3) unsatisfactory–satisfactory 4) discouraging–encouraging 5) irritating–tolerable	0.92
<p><b>Perceived consequences for patients<sup>b</sup>, measured using 8 items<sup>f</sup></b>                      “In my opinion, incorporating CIM into the usual practice of care for psychiatric patients: 1) is likely to lead to adverse effects; 2) is effective in reducing the symptoms suffered by patients; 3) reinforces the patient’s commitment to their treatment; 4) may decrease the patient’s adherence to their medication regimen; 5) would enrich the care</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.89

**Table 1 (continued)**

TIB variables	Likert scale	Cronbach's $\alpha$
<p>offered; 6) would risk reinforcing florid symptoms; 7) could weaken patients; 8) would make it easier for patients to integrate their bodily feelings.”</p>		
<p><b>Perceived consequences for staff<sup>g</sup>, measured using 4 items<sup>g</sup></b>                      “In my opinion, incorporating CIM into the usual practice of care for psychiatric patients: 1) would strengthen the therapeutic relationship; 2) might decrease caregivers’ feelings of powerlessness with some patients; 3) would decrease the use of psychotropic drugs; 4) enables mediation in difficult relationships with patients.”</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.69
<p><b>Descriptive norms, measured using 3 items</b>                      1) “Colleagues in my care unit incorporate CIM into their usual practice with psychiatric patients.” 2) “CIM is sometimes incorporated into usual practice with psychiatric patients in my institution.” 3) “No one incorporates CIM into their usual practice with psychiatric patients in my care unit.”</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.79
<p><b>Structural facilitating conditions<sup>h</sup>, measured using 7 items<sup>h</sup></b>                      “I would incorporate CIM into my usual clinical practice with psychiatric patients:                      1) if I was aware of scientific evidence of its effectiveness; 2) if there was appropriate infrastructure (suitable rooms, etc.); 3) if this did not result in excessive costs for patients; 4) if I had the time available for this; 5) if my institution allowed me to; 6) only if they consented to it; 7) only if this was part of the care plan selected by the multi-professional care team.”</p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	0.79
<p><b>Past behavior</b> (preceding month), <b>measured using 1 item</b>                      “How often have you incorporated CIM into your usual clinical practice in the past month?”</p>	4 response options: 1 (Never), 2 (Once), 3 (Two to five times) and 4 (More than five times)	One item
<p><b>Extra factor of Personal normative beliefs<sup>i</sup>, measured using 2 items</b></p>	7-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree)	–

(continued on next page)

Table 1 (continued)

TIB variables	Likert scale	Cronbach's $\alpha$
1) "I would be in favor of combining ICM with my usual practice with psychiatric patients." 2) "Combining ICM with my usual practice with psychiatric patients is in line with my personal values."		
<b>Intention</b> (the independent variable), <b>measured using 3 items</b> 1) "Over the next three months, my intention to incorporate CIM into my usual clinical practice with psychiatric patients is ..."; 2) "If I have the opportunity to do so, I will incorporate CIM into my usual clinical practice with psychiatric patients over the next three months."; 3) "Over the next three months, I think that the likelihood that I incorporate CIM into my usual clinical practice with psychiatric patients is ...."	5-point Likert scale ranging from: 1) Very low to High; 2) Strongly disagree to Strongly agree; 3) Very low to High	0.89

Note.

<sup>a</sup> PCA split the initial factor of *facilitating conditions* into two separate factors: *conditions facilitating CIM* and *structural facilitating conditions*.

<sup>b</sup> PCA split the initial factor of *perceived consequences* into two separate factors: *perceived consequence for patients* and *perceived consequence for staff*.

<sup>c</sup> PCA did not retain the factor of *personal normative beliefs*, but it was nevertheless tested on *intention* because of its repeated appearance in the literature. This requires further research.

<sup>d</sup> PCA deleted 2 of the initial 7 items of *perceived social norms*—1 item from *perceived social roles* and 1 item from *normative beliefs*.

<sup>e</sup> PCA deleted 1 of the initial 11 items of *facilitating conditions*.

<sup>f</sup> PCA deleted 1 of the initial 13 items of *perceived consequences*.

factorability using the Kaiser–Meyer–Olkin measure of sampling adequacy and Bartlett's test of sphericity [51]. The eigenvalues criterion was then used to determine how many factors to extract, and the direct oblimin rotation method was performed because the factors were likely to be correlated [51].

Candidates for potential deletion were selected using the following criteria [52]: an item's factor loading had to be > 0.4; otherwise it was a candidate for deletion; if an item was cross-loaded on several components, its highest factor loading had to be  $\geq 0.5$  and its difference from the second-highest factor loading had to be  $\geq 0.3$ ; otherwise it was a candidate for deletion. Thus, an item whose highest factor loading was 0.55 and whose second-highest loading was 0.3 was a candidate for deletion. *Past behavior*, which was measured using a single question, was not included in the PCA.

The authors then evaluated items selected as potential candidates for deletion to determine their impacts on the model. If a candidate was deemed essential to the model, it was retained; otherwise, it was deleted. Items were deleted one at a time and then the PCA was run again, following the same steps (KMO, eigenvalues, candidate screening, evaluation, deletion) until no more potential candidates for deletion emerged.

The results indicated that most of the factors taken from the adapted TIB were selected by the PCA. Fig. 2 shows the final TIB model tested following the PCA analyses. The factors of *perceived consequences* and *facilitating conditions* were shared between two different factor groups of

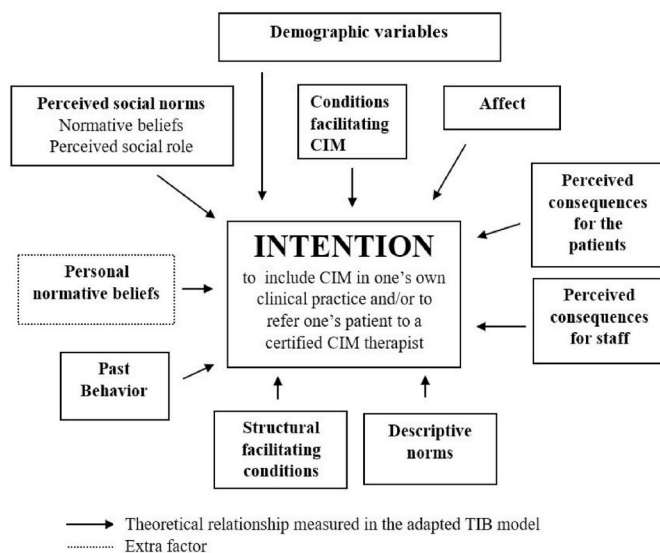


Fig. 2. Final TIB model tested following the PCA analyses.

each original factor, which refined and specified their content: *perceived consequences for patients* and *perceived consequences for staff*, and *structural facilitating conditions* and *conditions facilitating CIM*. The factors of *self-identity* and *personal normative beliefs* did not pass the PCA test. Nevertheless, because the literature often describes somatic unit health-care professionals' attitudes towards CIM, we decided to retain *personal normative beliefs* and test the strength of their effects anyway. The final TIB model tested was thus composed of seven factors retained by the PCA plus the extra non-retained factor of *personal normative beliefs*. Table 1 describes the factors and the items retained by the PCA.

#### 4.7. Statistical analysis of the intention to use CIM

To identify the factors that played a significant part in predicting the health-care professionals' intentions to use CIM, respondents were classified into two groups according to the median value of the intention score (median = 12; range = [3–15]): the group with the intention to use CIM (intention score  $\geq 12$ , coded 1) and the group without that intention (intention score < 12, coded 0). The scores of the items composing each factor were summed to give an overall total factor score. Data (sociodemographic variables and calculated scores by latent construct) were then summarized by group as numbers and percentages for categorical variables and as means and standard deviations (SD) for continuous variables. Associations between each independent variable and the outcomes were assessed using a univariate logistic regression model, and the strengths of these associations were measured using the odds ratio (OR) and the *p*-value.

Those variables associated with the intention to use CIM that had *p*-values < 20% were then used in a logistic regression backward procedure to fit the multivariate model. A fractional polynomial model was used to check the linearity of the relationship between continuous variables and the intention to use CIM. Potential interactions were also tested, model diagnostics were performed to check for residuals, and influential observations and model calibration were tested using the Hosmer–Lemeshow goodness-of-fit test. The power of discrimination between the two groups was calculated using the area under the ROC curve (*AUC*). To get an accurate estimate of our model's power of discrimination, we performed an internal validation using the bootstrap method described by Harrell et al. [53]. This method enables the calculation of the *optimism* of our model's predictive discrimination. The  $AUC_{bootstrap} = (AUC - optimism)$ , constituting an unbiased estimate of external predictive discrimination. Statistical analyses were performed using Stata 16 (StataCorp. 2019. Stata Statistical Software: Release 16.

College Station, TX: StataCorp LLC) and IBM SPSS Statistics 23 (X9-IBM Corp.)

## 5. Results

### 5.1. Respondents' characteristics

The survey was distributed to all the 197 health-care professionals working in northern Vaud's psychiatric care units—66 GPs (33%), 82 nurses (40%), and 49 paramedical staff (27%)—of whom 122 began the questionnaire and 105 fully completed it (53%). Table 2 shows the sociodemographic characteristics of the 105 respondents, whose average age was 40.63 years old ( $\pm 10.3$ ). More females (79%) than males (21%) responded, but this fitted the sample population (77% female, 23% male). GPs accounted for 27.6% of respondents, paramedical staff represented 47.6%, and psychosocial nursing staff made up 24.8%. Paramedical staff were thus slightly over-represented among respondents as they composed 39.6% of the sample population. This was at the expense of GPs (33.5% of the sample population) and psychosocial nursing staff (26.9%). More than half of the respondents (54.3%) had used CIM in their clinical practice at least once in the past, even though only 24.8% of them had undergone approved training in CIM. Respondents had an average of 13.69 years ( $\pm 9.88$ ) of experience in clinical practice, and 75.2% used CIM personally (for themselves or close relatives).

### 5.2. Factors regarding the TIB and sociodemographic characteristics by groups' intentions to use CIM

Summary data for all factors, differentiated by the groups' intentions to use CIM or not (Yes or No), are presented in Table 3. Means (SD) for principal factors of the TIB were: *perceived social norms*, 28.8 (3.3) for Yes vs. 22.4 (4.9) for No; *conditions facilitating CIM*, 18.9 (2.6) for Yes vs. 15.5 (3.4) for No; and *affect*, 31.4 (3.1) for Yes vs. 25.2 (5.2) for No.

**Table 2**  
Sociodemographic characteristics of the 105 respondents.

Variable	All (N = 105)		GPs (n = 29)		Nurses (n = 50)		Paramedical staff (n = 26)	
	n	%	n	%	n	%	n	%
Sex								
Male	22	21.0	8	27.6	11	22.0	3	11.6
Female	83	79.0	21	72.4	39	78.0	23	88.4
Age (mean (sd))	40.6	(10.35)	39.7	(9.90)	40.3	(10.28)	42.3	(11.16)
Years of clinical practice (mean (sd))	13.7	(9.88)	11.0	(8.47)	15.1	(9.67)	14.0	(11.39)
Is a parent								
Yes	73	69.5	18	62.1	34	68.0	21	80.8
No	32	30.5	11	37.9	16	32.0	5	19.2
Works in								
Outpatient care	50	47.6	21	72.4	17	34.0	12	46.2
Inpatient care	42	40.0	6	20.7	29	58.0	7	26.9
Both	13	12.4	2	6.9	4	8.0	7	26.9
Managerial position								
Yes	36	34.3	17	58.6	10	20.0	9	34.6
No	69	65.7	12	41.4	40	80.0	17	65.4
Undergone recognized CIM training								
Yes	26	24.8	7	24.1	13	26.0	6	23.1
No	79	75.2	22	75.9	37	74.0	20	76.9
Used CIM in clinical practice								
Yes	57	54.3	18	62.1	27	54.0	12	46.2
No	48	45.7	11	37.9	23	46.0	14	53.8
Used CIM personally								
Yes	79	75.2	20	69.0	37	74.0	22	84.6
No	26	24.8	9	31.0	13	26.0	4	15.4

Mean (SD) for the principal sociodemographic factors were: *age*, 39.7 (9.6) for Yes vs. 41.8 (11.2) for No; *female sex*, 81% for Yes vs. 76.6% for No; *years of clinical practice*, 11.7 (8.5) for Yes vs. 16.1 (11.0) for No; *has used CIM in their psychiatric clinical practice*, 72.4% for Yes vs. 31.9% for No; *had undergone recognized training in CIM*, 32.8% for Yes vs. 14.9% for No; *used CIM in their personal life*, 86.2% for Yes vs. 61.7% for No.

#### 5.2.1. Factors associated with the intention to use CIM

Univariate analyses of the post-PCA factors of TIB (Table 3) showed that seven factors were highly significant predictors of *intention: perceived social norms* (OR = 1.57,  $p < 0.0001$ ); *conditions facilitating CIM* (OR = 1.45,  $p < 0.0001$ ); *affect* (OR = 1.46,  $p < 0.0001$ ); *perceived consequences for patients* (OR = 1.21,  $p < 0.0001$ ); *perceived consequences for staff* (OR = 1.32,  $p < 0.0001$ ); *descriptive norms* (OR = 1.28,  $p < 0.0001$ ); *past behavior* (last month) (Never, OR = 0.03,  $p \leq 0.0001$ ; Once, OR = 1.97,  $p = 0.28$ ; 2–5 times, OR = 5.52,  $p = 0.002$ ; More than 5 times, OR = 8.96,  $p = 0.001$ ). The factor of *structural facilitating conditions* was nearly a significant predictor of *intention* (OR = 1.05,  $p = 0.0592$ ). The extra factor of *personal normative beliefs* also predicted *intention* (OR = 2.25,  $p < 0.001$ ).

In addition, four sociodemographic variables significantly predicted the intention to use CIM (Table 3): *having used CIM in one's clinical practice in the past* (OR = 5.6,  $p < 0.0001$ ); *used CIM in their personal life* (OR = 3.88,  $p = 0.004$ ), and *having undergone training in CIM recognized by the respondent's institution* (OR = 2.78,  $p = 0.031$ ). Note that *the respondent's number of years of clinical practice* (OR = 0.95,  $p = 0.023$ ) was significantly negatively associated with *intention* to use CIM.

Variables predicting the intention to use CIM, with a  $p$ -value  $< 20\%$ , were then used, via a backwards logistic regression procedure, to fit a multivariate model that would best explain that intention. The following variables were deemed to form the best model (Table 3): *perceived social norms* (OR = 1.53,  $p < 0.0001$ ), *conditions facilitating CIM* (OR = 1.33,  $p = 0.041$ ), and *affect* (OR = 1.24,  $p = 0.032$ ). These three variables significantly predicted ( $p_{model} < 0.0001$ ) *intention*. As shown by the

Table 3

Comparison of the group intending to use CIM (Yes) vs. the group not intending to use CIM (No), using univariate and multivariate logistic regression analyses.

	Descriptive statistics				Univariate		Multivariate	
	Intention to use CIM - Yes		No intention to use CIM - No		Intention to use CIM - Yes		Intention to use CIM - Yes	
	%	(n)	%	(n)				
Total number of participants (n = 105)	55.2	[58]	44.8	[47]	–		–	
<b>TIB factors</b>	mean	(sd)	mean	(sd)	<b>OR</b>	<i>P</i> -value	<b>OR</b>	<i>P</i> -value
Perceived social norms (5 items)	29.8	(3.3)	22.4	(4.9)	1.57	< 0.0001 <sup>a</sup>	1.53	< 0.0001 <sup>a</sup>
Conditions facilitating CIM (3 items)	18.9	(2.6)	15.5	(3.4)	1.45	< 0.0001 <sup>a</sup>	1.33	0.041 <sup>a</sup>
Affect (5 items)	31.4	(3.1)	25.2	(5.2)	1.46	< 0.0001 <sup>a</sup>	1.24	0.032 <sup>a</sup>
Perceived consequences for patients (8 items) <sup>1</sup>	47.9	(5.5)	41.2	(6.2)	1.21	< 0.0001 <sup>a</sup>	–	
Perceived consequences for staff (3 items)	21.4	(3.5)	18.5	(2.9)	1.32	< 0.0001 <sup>a</sup>	–	
Descriptive norms (3 items)	17.0	(3.3)	14.4	(3.2)	1.28	< 0.0001 <sup>a</sup>	–	
Structural facilitating conditions (7 items)	38.2	(7.1)	35.5	(7.3)	1.05	0.07	–	
Past behavior (preceding month)	%	(n)	%	(n)				
- Never (ref)	6.9	[4]	74.5	[35]	–	–	–	
- Once	15.5	[9]	8.5	[4]	19.68	< 0.0001 <sup>a</sup>	–	
- 2 to 5 times	39.7	[23]	10.6	[5]	40.25	< 0.0001 <sup>a</sup>	–	
- More than 5 times	37.9	[22]	6.4	[3]	64.17	< 0.0001 <sup>a</sup>	–	
Extra factor								
Personal normative beliefs (2 items)	13.1	(1.2)	10.6	(2.3)	2.25	< 0.0001 <sup>a</sup>	–	
<b>Sociodemographic factors</b>	%	n	%	n	<b>OR</b>	<i>P</i> -value	–	
Age (mean (sd))	39.7	(9.6)	41.8	(11.2)	0.98	0.308	–	
Sex (female)	81.0	[47]	76.6	[36]	1.30	0.579	–	
Is a parent (Yes)	69.0	[40]	70.2	[33]	0.94	0.890	–	
Has a managerial position (Yes)	31.0	[18]	38.3	[18]	0.73	0.436	–	
Years of clinical practice (mean (sd))	11.7	(8.5)	16.1	(11.0)	0.95	0.023 <sup>a</sup>	–	
Job – GP	32.8	[19]	21.3	[10]	1.49	0.407	–	
Job – Nurses	50.0	[29]	48.9	[23]	0.79	0.867	–	
Job – Paramedical staff	17.2	[10]	29.8	[14]	0.56	0.250	–	
Has used CIM in their psychiatric clinical practice (Yes)	72.4	[42]	31.9	[15]	5.6	< 0.0001 <sup>a</sup>	–	
Has undergone recognized training in CIM (Yes)	32.8	[19]	14.9	[7]	2.78	0.031 <sup>a</sup>	–	
Used CIM in personal life (Yes)	86.2	[50]	61.7	[29]	3.88	0.004 <sup>a</sup>	–	

<sup>a</sup> Significant result.

Hosmer–Lemsho test (Hosmer–Lemsho  $\chi^2$  [3] = 3.54; Prob >  $\chi^2$  = 0.31), our model fits reasonably well, and as assessed by the area under the ROC curve, its power to discriminate between the two groups (people with the intention to use CIM vs. people without that intention), at 94.74%, was excellent. Internal validation of our multivariate model, using the bootstrap method described by Harrell et al. [53], estimated an optimism of 1%. The model's corrected performance was therefore estimated at 93.74% (94.74%–1%). This value constitutes an unbiased estimate of the power of external predictive discrimination. The latter result suggests that priority actions to promote the incorporation of CIM into the clinical practice of psychiatric health-care professionals should focus on these three factors.

## 6. Discussion

Based on Triandis' Theory of Interpersonal Behavior, this study aimed to determine how psychosocial and sociodemographic factors influenced health-care professionals' (N = 105) intentions to use CIM in their psychiatric clinical practice with adults. The study indicated that 55.2% of participants intended to use CIM in their clinical practice with adults with mental illness in the next three months. Our multivariate model identified three main factors (*perceived social norms*, *conditions facilitating CIM*, and *affect*) associated with the intention to practice CIM in psychiatry. The model allowed us to discriminate between people who intended to use CIM and those who did not, with an AUC of 94.74%. The adapted factors of the TIB that we used therefore formed an excellent model for explaining health-care professionals' intention to use CIM. This result suggests the need to prioritize actions supporting these three factors in order to encourage psychiatric health-care professionals to use CIM in their clinical practice.

Some studies [38,44] using the TIB model to study other health-care professionals' intentions to adopt a new professional behavior also revealed the significant influence of one or both of the two sub-components of *perceived social norms* (i.e., *normative beliefs* and

*perceived social roles*). A study of physicians' intentions to use telemedicine identified the significant effect of *perceived social norms* [44]; a systematic review identified that the factor of *role beliefs* was a substantial determinant of intention [38]. We can therefore consider *perceived social norms* to be a key factor in predicting health-care professionals' intentions to adopt a new professional behavior. This means that professionals may be more willing to use CIM if they identify it as an integral part of their professional role, involving a person-centered approach and taking into account the patients' preferences, values, and beliefs [22,26]. The use of CIM also requires institutional, hierarchical, and peer acceptance. These findings are in line with other studies showing that physicians [34,35,47] and nurses [28,36,54] need clear direction from the greater medical community, their peer group, and their institution. The literature indicates physicians' central role in facilitating and supporting the implementation of CIM among their peers [55–57]. According to some authors, the institutional processes required for incorporating CIM into practice are often heterogeneous and disparate, and introducing CIM could be facilitated if physicians promoted such projects to their hospital management boards [29,30].

Concerning the factor of *conditions facilitating CIM*, the literature is fairly consistent in indicating that health-care professionals' lack of knowledge about CIM limits the incorporation of these approaches into their clinical care and affects the quality of the information and counselling that they can give to patients about CIM [27,28,33,34,36,47,54]. We suggest that this factor, which describes the conditions for the safe use of CIM (having knowledge of CIM, being trained in CIM by one's institution, or having CIM practitioners recognized by the institution), represents a necessary condition for the professional being able to integrate CIM effectively and safely and make appropriate use of it with patients. Training health-care professionals in CIM should be a priority action for institutions wishing to introduce it or, at the very least, professionals should have access to experts in CIM recognized by their institution. This would help them to better inform psychiatric patients, support them with the most appropriate CIM, and identify possible

adverse effects or the risks of interactions with pharmaceutical treatments.

The scientific literature has yet to directly describe *affect's* importance in the use of CIM in psychiatric clinical practice. In studies using the TIB model, *affect* was not a significant predictive factor of intention among non-health-care staff [38,44,45]. *Affect* is the result of previous experiences and requires the use of long-term memory [40]. If positive *affect* is felt at the thought of adopting a given behavior, that psychological state will result in the body trying to maximize that feeling, both in terms of frequency and intensity, which will reinforce the intention to repeat the behavior [40,44]. Because psychiatric care requires interpersonal interaction involving personal involvement [58,59], we suggest that caregivers are particularly attentive not only to the patients' emotions but also their personal affective state [58]. We suggest that using CIM can constitute a non-conventional approach to promoting therapeutic relationships, with the implication that health-care professionals develop a different type of self-awareness about their feelings. This might help them to improve their capacity for self-regulation and emotional well-being, which will have implications on maintaining fruitful and satisfying therapeutic relationships with patients [60] and which may increase job satisfaction [28]. This factor will require further exploration to understand and better identify the origin of these emotions.

In addition to considering the three main factors, other psychosocial factors have a significant influence on intention. Following the PCA, our study differentiated *perceived consequences for patients* from *perceived consequences for staff*, and both had a very significant influence on intention. Our results concerning *perceived consequences for patients* were consistent with the literature, which describes improvements to mood disorders and anxiety [3,28,36], stress [28,36], sleep [28,36], and a more general contribution to improved health [28,35]. CIM also seems to encourage patient empowerment [28] and increase their involvement in their treatment [35]. Our findings on *perceived consequences for staff* indicated a great interest in how CIM could enrich clinical practice. We noted that health-care professionals perceived that incorporating CIM had multidimensional positive effects on psychiatric care. The literature also indicates that using CIM encourages robust therapeutic relationships [35] and facilitates patient–nurse communication, patient-centered care, and a more humanistic way of practicing that care [26,28]. This is consistent with the professional psychiatric values of person-centered care [22]. Despite their potential for indirect positive effects on psychiatric patients' conditions, there is little evidence of research in this field in the quantitative literature.

*Descriptive norms* also very significantly influenced our respondent's intentions to use CIM. This factor also remains relatively unexplored in the literature, and it is not clearly distinguishable from *peer approval*. The factor of *structural facilitating conditions* came close to having a significant effect on intention, and this result needs to be confirmed in further studies using larger populations. Several studies have described how such structural barriers as the lack of scientific evidence [36], the lack of reimbursement programs [29,36], and the lack of time [27] represent barriers to the use of CIM in practice. The *past behavior* of having used CIM in clinical practice in the preceding month was a very strong predictor of the intention not to use it in the future. Having used CIM 1–5 times or more in the preceding month led to a high statistical probability of the intention to use it again in the future. Previous studies had not examined *past behavior* in this way. The extra factor of *personal normative beliefs*, which did not pass the PCA, also had a high significant effect on intention. This extra factor demonstrated the importance of participants' opinions and personal values with regards to incorporating CIM into their practice—a result similar to Godin's indication of the importance of *moral norms* [61]. According to the literature on *moral norms* [61], participants whose intentions are most consistent with their own moral standards are more likely to adopt a new behavior. These authors suggested that internalized norms and personal expectations are important factors in the development of a person's motivation to engage

in a given behavior [61].

The present study also noted the significant effects that the socio-demographic factors of *having used CIM in one's personal life*, *having already incorporated CIM into one's clinical practice*, and *being trained in CIM approaches recognized by one's institution* had on the intention to use CIM. However, we also found that the *number of years of clinical practice* had a negative statistical influence on the intention to use CIM, with older professionals perhaps having less interest in CIM than younger ones. A systematic review [28] noted seven studies that had reported that a previous positive personal experience of CIM could lead to it being used on or recommend to patients, even by professionals previously skeptical about the value of such therapies. Another study showed that nurses' and midwives' positive opinions of CIM were more closely associated with their personal experiences of it than were physicians' opinions [33]. Personal experience was the main factor explaining the positive attitudes and beliefs towards CIM among nursing students and chiropractic students [62]. Comparisons showed that health-care professionals trained in CIM were more influenced by their positive personal experiences of CIM and literature-based factors than were professionals not trained in CIM [33]. In another study, respondents trained in one or more CIM approaches reported a greater intention of using them than those who had never had any training [35]. Concerning professional seniority, Godin et al. [35] noted a slightly significant weaker intention to use CIM among 60–75-year-olds than among their younger colleagues. However, one systematic review [47] indicated that associations between physicians' sex or age and their attitudes towards CIM varied across studies. Those authors suggested that the lack of consistent correlations could be due to different definitions and categorizations of CIM.

### 6.1. Study limitations

The present study's target-group response rate was moderately satisfactory and comparable to Godin's study dealing with a closely related subject but using another theory of behavior [35]. Our study of 105 psychiatric-sector professionals should not be generalized to all health-care professionals in this field, and the questionnaire should be tested on larger populations. Although most respondents held positive views of CIM, it is quite possible that non-respondents had no interest in the subject or held negative views about it; thus, there is a risk of a positive bias towards CIM. Moreover, the study was conducted in Switzerland, where the general population is particularly interested in the use of complementary treatment approaches, which may also explain the interest of health professionals. Switzerland's obligatory basic health insurance reimburses four CIM approaches (anthroposophic medicine, homoeopathy, phytotherapy, and traditional Chinese medicine) if they are carried out by qualified physicians, and this may also encourage professionals to use them. Nevertheless, hospital billing processes for CIM treatments are complex, and these may limit their use in hospital settings [30].

The reliability of our adapted version of the factors of the TIB was good enough to study health-care professionals' intentions to use CIM in their clinical practice in psychiatry. The factors of *past behavior* and *personal normative beliefs* were considered despite them being rejected by the PCA. Testing them showed that both had a high statistical association with health-care professionals' intentions to incorporate CIM into their practice, but further investigation would be needed on a larger population. Finally, the English translation of our questionnaire needs to be validated.

### 6.2. Recommendations for practice and future research

Although the present study's results should be confirmed in a larger population, they can provide some guidance to health-care institutions wishing to support the incorporation of CIM into clinical practice. Health-care professionals should identify with CIM, promote it as part of



a person-centered approach, and see this as a part of their professional role. We thus suggest that psychiatric institutions disseminate a clear position in favor of incorporating CIM into clinical care and that these approaches should always take place with the patient's full agreement. Furthermore, institutions should establish policies for training health-care professionals in CIM or for ensuring access to CIM therapists, recognized by the institution, to whom their patients can confidently be referred. The only sociodemographic factors in our study that significantly predicted the intention to adopt CIM were related to personal or professional experiences with those approaches, which is consistent with the need to develop health-care professionals' skills and knowledge of them. Given the growing interest in CIM among patients worldwide, health-care professionals' initial training should also develop their knowledge in this domain so that they can support and advise their patients on appropriate choices. Our study also identified the importance of considering the emotional processes affecting psychiatric health-care professionals' intentions to use CIM. This factor requires further research.

Finally, we observed that psychiatric health-care professionals perceived multiple positive consequences when incorporating CIM into their clinical practice. These results provide new directions for research into how CIM improves therapeutic relationships or creates greater patient commitment to their own treatment. Although these elements could have indirect positive effects on psychiatric patients' conditions, they have yet to be significantly explored with quantitative studies.

The present study, using an expanded number of factors of the TIB, was well able to identify the psychosocial factors that best predicted psychiatric health-care professionals' intentions to incorporate CIM into their practice. Its innovative questionnaire, completed by respondents working in an environment rather favorable to CIM, requires a confirmatory study and external validation. Behavioral theories should be used more widely in research to better understand the multiple factors influencing professional behaviors.

### Sample credit author statement

**Schaub Corinne:** Project design and administration, Methodology, Investigation, Formal qualitative analysis, Writing the original draft. **Catherine Bigoni:** Methodology, Investigation, Formal qualitative analysis. **Quentin Baumeler:** Investigation, Data Curation, Participation in formal quantitative analysis, Writing the original draft. **Mohamed Faouzi:** Methodology, Formal quantitative analysis, Reviewing and editing writing. **Kétia Alexandre:** Supervising design and methodology, Reviewing and editing.

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### Declaration of competing interest

None.

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