REVIEW

The transtheoretical model and substance dependence: theoretical and practical aspects

O modelo transteórico e a dependência química: aspectos teóricos e práticos

Fabiana Andrioni De Biaze Vilela,[1] Flávia Serebrenic Jungerman,[2] Ronaldo Laranjeira,[1] Russell Callaghan[3]

Abstract

Objective: *This paper aims to present and discuss the Transtheoretical Model and its importance for the treatment of substance abuse disorders.* ***Method:*** *A literature review was made based on articles from the last 10 years in substance use with human subjects found in PubMed (Medline) and the Scientific Electronic Library Online, as well as on the main books written by the creators of the model. From the initial collection of articles related to the Transtheoretical Model, the University of Rhode Island Assessment and substance abuse, those related to other health conditions were excluded. Although articles related to hospitalization were also excluded, as were those related to the Minnesota Model, treatment proposals were included.* ***Results:*** *Although the TTM has been studied for over 20 years, new concerns regarding the initial idea continue to arise. Such concerns include the cross-sectional design of studies employing the model, as well as the prescriptive versus descriptive point of view.* ***Discussion:*** *The review of the Transtheoretical Model brought intentional behavior change to light, which could broaden the understanding of addictive behaviors. Together with its concepts of processes and stages of change, the Transtheoretical Model provides professionals with the idea that the effectiveness of therapy is dependent upon the capability of the therapist to match the technique to the current motivational stage of the patient in the process of change. This demonstrates the importance of identifying the stage of change of the patient when they present for treatment. Here, we describe the principal elements of the Transtheoretical Model, as well as the instruments currently used to identify the stage of change. Finally, criticisms and limitations of the model are discussed.*

Keywords: *Substance abuse; Behavior; Treatment outcome; Motivation; Review literature as topic*

Resumo

Objetivo: *Este artigo tem como objetivos a apresentação e discussão do Modelo Transteórico e sua importância para o tratamento da dependência química.* ***Método:*** *Foi feita revisão de literatura baseada em artigos dos últimos 10 anos sobre abuso de substâncias com sujeitos humanos encontrados no PubMed (Medline) e a* Scientific Electronic Library Online, *bem como as principais obras dos idealizadores da Teoria. Dos artigos encontrados inicialmente sobre o Modelo,* University of Rhode Island Assessment *e dependência química, aqueles relacionados a outras condições de saúde foram excluídos. Propostas de tratamento foram consideradas (exceto Modelo Minnesota e internação).* ***Resultados:*** *Novas diretrizes surgem sobre a idéia inicial da teoria, apesar da mesma já ser estudada há mais de 20 anos: estudos transversais empregando o modelo, bem como a avaliação do potencial prescritivo ou descritivo do mesmo.* ***Discussão****: Esta teoria enfoca a mudança intencional de comportamento, o que ampliou a compreensão dos comportamentos aditivos. O Modelo Transteórico sugere aos profissionais que a efetividade do tratamento depende da capacidade do mesmo de aplicar a técnica adequada à situação motivacional do paciente no processo de mudança. Isto demonstra porque é tão importante identificar o estágio de mudança do paciente quando este ingressa no tratamento. O artigo descreve os principais elementos da teoria bem como os principais instrumentos usados atualmente para identificar os estágios. Por fim, são discutidas as críticas e as limitações do modelo.*

Descritores: *Abuso de substâncias; Comportamento; Efetividade de tratamento; Motivação; Literatura de revisão como assunto*

[1] Unidade de Pesquisas em Álcool e Drogas (UNIAD, Alcohol and Drugs Research Unit), Universidade Federal de São Paulo (Unifesp), São Paulo, Brazil
[2] Independent Researcher, São Paulo (SP), Brazil
[3] Department of Public Health Sciences, Centre for Addiction and Mental Health, University of Toronto, Toronto, Canada

Submitted: September 26, 2008
Accepted: June 5, 2009

Correspondence
Fabiana Andrioni De Biaze Vilela
Endereço: Rua das Olarias 168 – Canindé – São Paulo – S.P.
CEP: 03030-020
Fax: 011-3311-0550
E-mail: fabiana.biaze@gmail.com

Introduction

The past two decades have been marked by numerous studies on intentional behavior change, especially concerning addictive behaviors. Some of those studies[1,2] have attempted to outline the behavior change process. One such study was conducted by Prochaska and DiClemente,[3] who proposed the Transtheoretical Model (TTM), which is known worldwide as the stages-of-change model and commonly adopted as a guideline for clinical interventions for a wide range of health problems, such as substance use disorders.[4] The authors stated that the development of their theory was related to the need for coherent organization of the processes of intentional behavior change. The theory is based on experimental data obtained through surveys completed by individuals with nicotine dependence who achieved smoking cessation without enrolling in treatment.[3,5] This model emphasize the importance of a wider view of the individual, which allows a more accurate evaluation of patient condition, in comparison with the historic conception that success or failure in changing the addictive behavior is a function of denial.[2,6]

This model intends to understand behavioral change by defining the tasks, steps, experiences, contexts and main processes of which it is composed and that differentiate between success and failure: in each phase of the change, success is associated with task accomplishment, which promotes engagement with the targets in the subsequent phase.[5]

Intentional behavior change is defined as alterations in habitual patterns of behavior related to problems such as substance use disorders and obesity. These alterations can in individuals who are under treatment, as well as in those who are not. Changing the behavior is crucial to the success of substance abuse treatment, and many authors have attempted to explain this phenomenon. Therefore, it is important to understand the status of the discussion regarding the TTM, as well as the current criticisms and question related to the Model.

In the past decade, there have been a number of reviews of the TTM.[4,7,8] The objective of the present article was to review the literature on this issue, with the primary goal of defining and discussing the main concepts so that a reader unfamiliar with the TTM would be able to comprehend the model in its entirety. In addition, exploring the practical applications and the critiques of the model provides a more complete perspective. Although other authors around the have concentrated their efforts on exploring the relationship of the model to drug abuse, the main focus of the present article was marijuana dependence.

Method

The main sources used to obtain the articles for the literature review were the PubMed (Medline, 1997-2007) and Scientific Electronic Library Online (SciELO) databases, covering the scientific production on the theme within the last three decades. The search terms employed were “Transtheoretical Model”, “University of Rhode Island Assessment”, “substance abuse” and “treatment outcome”. A total of 75 articles were initially identified. Those involving human subjects with substance abuse problems (marijuana, cocaine or alcohol dependence), either in treatment or not, were selected for a more complex analysis. The final sample consisted of 20 articles.

Major concepts

The TTM defines intentional change as a process that does not occur at a specific moment, being sensitive to the dynamic changes that an individual presents over time in terms of motivational stage. Behavior change consists of four dimensions: stage; processes; context; and signs of change. The signs of behavior change have objective and subjective aspects that are comparable in any such change.[2,7,9] Movements are cyclic rather than linear, and individuals can transit into and out of earlier or later stages until achieving behavioral consistency and stability.

The authors of the model caution that dividing the process of behavior change into stages results in a sort of arbitrariness, since the limits of each phase were derived from their own background in terms of clinical observation and practice:[2,10,11]

- **Precontemplation:** no intention to change the behavior in the upcoming six months At this stage, the individual might not consciously believe that the behavior is a problem, or the problem is minimized so that the individual avoids facing any need to change. If the individual asks for treatment, it is because of extrinsic motivation (external pressure), which might nevertheless result in temporary changes in behavior. At the precontemplation stage, the main task is to become conscious of the existence of a problem and of the need to change habitual patterns of behavior. The most appropriate techniques are psychoeducational, providing individualized information and feedback.

- **Contemplation:** change under consideration, albeit without a commitment to action. At this stage, ambivalence is a relevant characteristic. It should be borne in mind that the benefits resulting from the considered changes must exceed the benefits of the problem behavior and be sufficient, according to the perception of the individual, to justify the alterations and possible losses deriving from the behavior change, which will establish the transition to the next stage. The initial approach to these patients might focus on motivating the individual to act on the decision, as well as on the benefits resulting from the change, allowing self-evaluation, as well as analysis of the individual context and the strengthening of self-efficacy, a concept to be discussed further in this article.

- **Preparation:** commitment to action. At this stage, the task to be accomplished is to strengthen the commitment and to establish an action plan that is in accordance with the individual context. Interventions at this stage might be directed toward the creation of this plan, considering a number of alternatives raised during the therapy process, so that the individuals select the alternative that is best for them and consequently commit to their decision.

- **Action:** the first step toward modification of previous patterns. At this stage, the individual becomes engaged and adopts a new attitude. Over a period of three to six months, new behavioral patterns can be established, modified and discontinued. During this period, the target task is the implementation of necessary changes in accordance with the action plan. Relevant interventions might take into consideration a periodic review of this plan or whenever necessary, reaffirming the commitment to the transformation.[2]

- **Maintenance:** sustaining and integrating new habits. The aim is to avoid relapses and consolidate the gains made in the previous stage. A behavior can be considered established and stable when it is automatically executed without the need to expend excessive energy or effort in order to maintain it. Maintenance is not a static stage but a continuous process that lasts at least six months and could be extended for longer periods.

- **Relapse:** cycling through the stages. Initially, the creators of the TTM defined relapse as a stage. However, after additional studies, a new configuration was applied to the model and relapse came to be redefined as a regression in the stages of behavior transformation. It is possible to go back and forth among the stages. Relapse is an expected part of the process and indicates

that individuals can cycle and recycle through the stages.[2,9,11] The intervention in this case should focus on a return to the previous plan, on the reinforcement of self-efficacy and on the renewing of confidence.[2,12] The transformation was initially defined as a linear progression in which cycles were unlikely to occur. However, over the years, the authors of the TTM[7,9,11,12] realized that the idealized linear progression rarely actually takes place. Therefore, the best visual description of the transformation would be a spiral shape. This representation more accurately represents the reality, since it accounts for evolution through the stages as well as for the possibility of relapse. After relapse, the patient might cycle and recycle through each phase before properly consolidating the transformation in behavior, learning from this experience and never coming back to exactly the same point of the process, thereby continuing to ascend the spiral.[12]

1. Processes of change

Identifying the stage of change is as important as understanding how the transition between stages occurs. In intentional behavior change, there are two related types of processes that allow this movement: experiential (thoughts and experiences, typically during the initial stages) and behavioral (actions related to the problem behavior).

According to the authors of the TTM, the concept of stages and processes has a high predictive potential in relation to treatment success (93% accuracy).[12-14] It is also of note that a recent literature review on this topic claimed that the "literature has validated the existence of change processes and suggests that these are linked to abstinence and recovery behaviors".[4]

2. Signs of change

Two concepts were considered relevant and were added to the TTM. The first is designated "decisional balance",[15] defined as consideration of the advantages and disadvantages of old and new behavioral patterns, and is used as the basis for any decision-making process. The second concept, self-efficacy,[16] addresses the self-perception of the potential to behave in one way or another. Two aspects might be monitored: when the individual encounters meaningful situations that might be triggers, an accurate self-assessment is necessary in order to identify a tendency to behave in a certain manner (ex: How likely would you be to smoke if you were at a party among smoking friends?").[2,17]

3. Context of change

In order to understand intentional behavior change more clearly, it is important to have a broad view of the subject, and see the addictive behaviors as part of a wider context in the life of the individuals. How does this behavior affect their life? In general, individuals who seek treatment have an addictive behavior that is already causing problems in more than one area, such as in their personal relationships (marital difficulties, etc.) or in their profession (difficulties with or at work). After identifying the areas in which there are problems, it is necessary to pay close attention to and deal with those problems through multiple treatment sessions, thereby increasing the possibility of treatment success.[2]

4. Stages of change assessment

From the time at which a patient enters treatment, it is important to assess the stage of change. The available means of identifying the stage of change are as follows:

- Readiness Ruler:[11] The Readiness Ruler consists of a line shown to the patient, who is then asked which point on the line reflects how motivated he or she is to change at that moment. Although this sort of assessment is rather simple and fast, it is an important reference for evaluation, since it establishes the goal of each patient related to the target change (e.g., abstinence or consumption reduction).

- Clinical interview: The clinical interview is used in order to elicit responses to questions addressing patterns and consequences of consumption, and those data are then analyzed in conjunction with other elements, so that the clinician can confirm the patient stage of change. In order to make an accurate assessment, the therapist must express no judgment and should avoid interpretations. Clinicians must be prepared to evaluate patients according to the concepts developed in the TTM. Therefore, it is fundamental that they are correctly prepared and aware of the potential for misinterpretation when determining the profile of each individual.

- University of Rhode Island Assessment: The University of Rhode Island Assessment (URICA) is a multidimensional questionnaire intended to assess the stages of change using a *Likert* scale. It is composed of 32 items, grouped into 8-item domains corresponding to four stages: precontemplation; contemplation; action; and maintenance. The original format permits its application to any type of problem and the vocabulary can be altered to apply to specific problems.[18]

The URICA is self-administered or applied by an interviewer, taking 5-10 min. It was first used to evaluate alcohol users but has been adapted for marijuana users in studies that have confirmed the validity of the instrument for application in the latter.[19] There have also been studies discussing the power of the instrument to give an accurate view of the stages of change. The URICA has been validated for use in the Brazilian population.[20]

- Stages of Change Readiness and Treatment Eagerness Scale: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) is a self-report questionnaire aimed at assessing the motivation for change in substance users. It consists of 19 items, organized into three subscales: Action (Action and Maintenance); Recognition (preparation); and Ambivalence (Contemplation). The validity of the SOCRATES questionnaire has been demonstrated in a number of studies, including studies conducted in Brazil.[20,21]

A precise evaluation of the stage of change in the beginning of the treatment is essential in order to identify the interventions and techniques that are most appropriate for use with each individual.

None of the instruments mentioned above provide a definitive answer concerning the stage at which a given individual is, mainly because the concept itself is not totally accurate. A wider view can be obtained by analyzing the data obtained from more than one of these measures, together with the perceptions of the therapist over the course of the process.[2,11,20]

Relationship between the Transtheoretical Model and other approaches

The creators of the TTM emphasize the difference between motivation for change and motivation for treatment: there are patients who seek treatment for substance abuse in order to resolve other conflicts, not because they want to change their substance use.[6]

Readiness is a more general concept than stage and indicates a desire to change or acceptance of the idea of engaging in a change process. It can be associated with two aspects of change: readiness for change (related to recognition of the problem and confidence in personal capacity to change), and readiness for treatment (motivation to seek and engage in treatment). In practice, these concepts might not be equivalent. The patient might be ready to

engage in treatment but not ready to change the habit of substance consumption.[6]

The TTM was created not only to describe the process of change but also to develop appropriate strategies for modifying patient motivational stage: by focusing on motivational aspects, it is possible to prepare and support those who are going through a process of change.[22] As previously mentioned, it is necessary to assess and identify the stages of change in order to ensure that the intervention is suited to the patient. Although action-oriented interventions will be effective for patients at the action or maintenance stage, they will not achieve the desired results in patients at earlier stages.[23,24]

Considering the concept of readiness as related not just to treatment but also to change and to the maintenance of change, two well-known approaches have proven to be effective in dependency treatment: Motivational Interviewing (MI)[25] and Relapse Prevention (RP).[26] These two approaches have some ideas in common with the TTM and provide additional elements to help the patient achieve goals in the change process.

1. Motivational Interviewing

The basis of MI is the interview itself, which focuses on readiness to change and engagement in treatment, as well as on the consideration that, in any process of behavior change, it is necessary to identify how much and what kind of change the patient is prepared to make. In addition, the concept of motivation is essential for any change and can be stimulated or strengthened by the therapist. In the MI model, motivation is defined as a state that can be changed according to the stimulation provided. Therefore, managing motivation is an important part of the role played by the clinician.

The authors of MI[25] define it as a directive advice technique with the goal of resolving ambivalence and increasing motivation for change. The identification of the cognitive discrepancy between personal objectives and reality is one of the objectives of MI, which also aims to stimulate patient capacity to solve problems and deal with behavioral triggers.

Considered a brief intervention, MI has six main elements: feedback according to the subjective experiences of the individual; patient responsibility for their own treatment and recovery; appropriate advice given when the patient encounters difficulties; menu of patient strategies related to the commitment; therapist empathy; and patient self-efficacy.

There is a great difference between this approach and those used in the 1970s, when the therapist-patient relationship was essentially based on confrontation, which was believed to stimulate the patient in the direction of recovery. Patient resistance might be more or less intense depending on the techniques used by the therapist: being empathic (not using a confrontational style) tends to achieve better results.[2,9,17] Resistance could also arise from the use of a technique that is inappropriate for a client in a particular stage of change: raising the possibility of changing a behavior to a patient who is in the precontemplation stage can lead him to contradict the therapist or even to drop out of treatment.[25]

2. Relapse Prevention

One can learn from lapses and transform a negative experience into an opportunity. The RP program is self-handling,[26] and its main goal is to teach prevention, to help the individual become able to manage high risk situations independently and to stimulate the inclusion of pleasant activities in their routine (in balance).

In order to prepare the patient to identify and face high-risk situations related to substance use, patient beliefs about the substance and about using it must be reviewed. Forms, questionnaires and tasks established beforehand are used to guide the clinical work. It is also necessary to mention the skills training needed in order to identify high-risk situations and create strategies to deal with them.

Another key point in this approach is that the patient becomes the agent of the change, free and responsible for the necessary changes to avoid relapse and target overall recovery, which goes along with some of the aspects of MI mentioned above.

As in MI, RP provides the patient with the tools appropriate for a given stage.

Critics of the model

The literature review of PubMed (Medline 1997-2007) and SciELO showed that studies on the TTM present diverse conclusions. After being widely discussed and accepted throughout the world, the TTM was recognized as an important tool in the treatment of substance use disorders, and, consequently, questions and conflicting opinions arose. One of the first critics of the model suggested that, although the TTM had established a new lexicon (new semantic elements that help build a different description of the less motivated patients), the concepts used are not precisely defined.[27]

Some authors have stated that the TTM provides a descriptive rather than evaluative means of understanding addictive behavior:[8] "...the use of a static stage of readiness to predict outcome is useful for identifying those at greatest risk for relapse. However this application falls short of elucidating the dynamic process of change."[4] In this sense, the model has a descriptive intent, focusing how the process of change should be, rather than how it really is or how it can be induced (prescription).

In a recent detailed bibliographic review of the model,[7] it was observed that, despite having significant value in treatment and defining behavior change as a complex process, the model oversimplifies the process, since it creates arbitrary categories related to arbitrary definitions. The stages were considered, and the authors of the review identified a need to empirically monitor movement between stages, as well as to reevaluate the definitions of the stages. The review concludes that, although the model is useful, there are points that could still be improved upon.

Concerning evolution through the stages of change, one recent study investigated the relationship between stage movement and consumption improvement.[28] The sample consisted of patients at the pre-action stages. The URICA was applied at baseline and after three months of treatment. The authors concluded that the improvement of patients who transitioned to the action stages was not different from the improvement observed in patients who remained at one of the pre-action stages. It was also observed that patients who remained at the precontemplation stage presented meaningful improvements in their problem behavior. The authors discuss whether the stages of change as described in the URICA truly reflect and accompany the improvement in substance consumption during treatment. In order to evaluate patients at baseline and thereafter, it is essential to use a reliable instrument, so that the stages can be correctly identified.

A new theory of the change process, designated the Plans, Responses, Impulses, Motives and Evaluations (PRIME) model, has been developed.[29,30] The author of the new theory mentions the wide acceptance of the TTM around the world but states that certain aspects of it are questionable: the arbitrariness of stage definitions and their boundaries (as mentioned by other critics);

and the attempt to classify changes in the individual as a means of affirming that such changes originate from stable plans based exclusively on cognition and conscious decisions. As a response, the author of the new theory states that motivation is composed of strengths, which drive actions and develop at five levels of complexity: plans (conscious mental representations of future action plans); responses (starting, stopping or modifying actions); impulses (restraining or stimulating strengths); motives (often experienced as wishes or desires); and evaluations (evaluative beliefs). Based on these concepts, the author created the theory of addiction,[29,30] which is defined as a social idea and not an object that can be defined from a single point of reference. According to this new theory, substance use disorder can be understood as a chronic condition of the motivational system in which a behavior that initially provided immediate reward/pleasure gets out of control.

Addictive behavior results from a number of alterations and might be better understood as a symptom. It can vary in severity and is expressed in different patterns of behavior, from binge use to chronic patterns. Although various activities and objects can be addictive, the reward value is not always sufficient to cause dependence. In the PRIME model, activities become addictive when they occur in an unbalanced motivational system.

In addiction issues, certain variables need to be considered: impaired self-control; unbalanced motivational system; ease of access to the behavior; costs of the behavior; environmental stress; other possibilities to obtain rewards; and social/cultural norms addressing the behavior. The problematic behavior begins when a shift in the balance of forces within the motivational system is followed by a meaningful event with which the individual cannot cope. In general terms, it can be described as loss of self-control, mood swing, stereotypical behavior and emotional/motivational conflict. According to the new theory, abstinence and additive behavior control are not necessarily related to the pleasure resulting from the target practices but rather to the intensity and frequency of those practices, to stress levels and to individual psychological problems.

Relapses most often take place in situations of great temptation: when the opportunity presents itself, with the possibility of reward or fulfillment of identified needs (situations that seem to be related to other benefits, for example, stress relief). However, relapse can also occur without any external trigger.

Interventions should be aimed at reducing impulses or creating an inhibitor that can operate when an opportunity for the addictive activity arises. In addition, it is important to carry out preventive interventions in order to increase the attention paid to subtle signals that can interfere with the balance of the system.

Still considering motivation, it is essential to discuss the self-determination theory (SDT), which has been developed over the past thirty years and incorporates concepts similar to those applied in the MI approach. The authors of recent studies[31,32] claim that both models consider patients to be naturally oriented to change, to growth, but state that the SDT focuses primarily on theoretical aspects of motivation, whereas MI focuses mainly on the practical aspects. By integrating the two, it would be possible to achieve a more complete perception of the motivation. Some concepts within the SDT contribute to understanding why techniques such as MI work. The SDT identifies three different psychological needs as being fundamental to the healthy functioning of human beings: the need for competence (humans actively seeking challenges, which leads them to growth and development - a concept similar to self-efficacy); the need for autonomy (humans obtain benefits from their capacity and from the sensation of choosing and being responsible for their own actions); and the need for relatedness (tendency to seek close relationships that can be helpful when a difficult situation arises). According to the SDT, MI works because it satisfies all three of those needs through the concepts of empathy (need for relatedness), offering strategies to deal with resistance (need for autonomy) and the focus on self-efficacy (need for competence).

Discussion

Although the TTM has been studied for over 20 years, new concerns regarding the initial idea continue to arise, since many researchers have attempted to describe the process of behavior change. In addition, the process of change is quite complex to describe and analyze, as is the field of addiction in general.

The TTM provides a broad and detailed characterization of intentional behavior change and recommends matching the proposed interventions to the patient stage of change. To that end, the stage must be identified, and a number of instruments have been designed for that purpose. However, the validity of such instruments has been questioned. Therefore, in order to obtain a broader view of the profile of a given patient and to understand the dynamic of the process as a whole, the professional needs to employ more than the instruments themselves and needs to be familiar with the characteristics, tasks and changes related to each stage. Having this broad view of the subject might aid the professional, working together with the individual, in correctly identifying the stage of change.[33]

The TTM proposes a way to understand intentional behavior change, as well as ways to enable the professional to act in response to the particular demands of each stage of change.

Some well-known approaches in the treatment of substance abuse, such as MI and RP, share concepts with the TTM and are widely used. The flexibility of the TTM can also be seen in MI and RP, which can be used in different settings and addressed to distinct populations without affecting the expected outcomes.

Critics tend to consider the TTM quite arbitrary in the stage boundaries and in the tasks description assigned to each of them. The TTM might work better as a prescriptive model rather than a descriptive one, since it predicts how the process of intentional change should ideally occur. The new theory,[29,30] which was created based on criticisms of the TTM, emphasizes the equilibrium of the motivational system as a predominant factor in dependence.

Despite the longitudinal proposal represented by the TTM, most of the studies in the literature regarding this model are cross-sectional, suggesting a descriptive, rather than prescriptive, point of view. This represents a limitation of the present review, since it is difficult to evaluate the long-term effectiveness of the TTM on the basis of such studies. This problem needs to be underscored as a possible limitation of all studies on this topic, since the available conclusions do not address changes over time. Another potential limitation is that the research conducted for this paper was sensitive to specific, previously defined terms, which might have caused us to overlook certain relevant articles.

After all of the criticism directed at the TTM, the model remains an important reference of how the change occurs in substance abuse treatment. Although the TTM is not a diagnostic system in and of itself, it can facilitate the evaluation of the patient and the treatment planning, considering the possibility of matching techniques to stages.

Although stage assessment might limit the perspective of professionals regarding the patient, clinical interventions can profit

from the use of this technique, which can help patients see the change process as dynamic, in conjunction with that other techniques.

Conclusion

The principal objective of the authors of the TTM was to propose a broad theory that would allow professionals to conceptualize, diagnose and treat substance abuse from a longitudinal point of view. Reviewing the literature, it is possible to notice that most of the studies focusing on the TTM have been cross-sectional, which suggests a lack of elements designed to analyze the longitudinal aspect. The literature also indicates that the TTM is applicable to nicotine dependence, although there is no evidence of its applicability to illicit drugs, which suggests that new studies concerning marijuana, cocaine and other such substances are needed.

One of the main points that clinicians must take into consideration when applying the TTM to their patients is the accurate evaluation of the stage, which can be better executed when the various measurement scales (the URICA, Readiness Ruler, SOCRATES, etc.) are integrated into the clinical interview. In addition, clinicians must know the structure of the TTM and the mechanisms of its application. Therefore, it is necessary to analyze all of the data plus the perceptions of clinicians, which are essentially based on their knowledge of the TTM.

Despite all of the discussion surrounding the TTM, many questions remain unanswered, such as the longitudinal aspect of the model and the prescriptive versus descriptive point of view. It would also be interesting to analyze how the other facets of the model (process, context and signs of change) could aids clinicians in designing their interventions.

Future studies could explore the longitudinal aspects of the model, focusing on illicit drugs in order to determine whether the model could be used a tool to predict the success or failure of treatment, as well as whether it is an efficient means of describing the process of change.

Disclosures

Writting group member	Employment	Research grant[1]	Other research grant or medical continuous education[2]	Speaker's honoraria	Ownership interest	Consultant/ Advisory board	Other[3]
Fabiana Androni De Biaze Vilela	UNIAD/UNIFESP	-	*	-	-	-	-
Flávia Serebrenic Jungerman	Independent researcher	-	*	-	-	-	-
Ronaldo Laranjeira	UNIAD/UNIFESP	-	**	**	-	-	-
Russel Callaghan	University of Toronto	-	-	-	-	-	-

** Modest*
*** Significant*
**** Significant. Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.*
Note: UNIAD/UNIFESP = Alcohol and Drugs Research Unit of the Universidade Federal de São Paulo.
For more information, see Instructions for authors.

References

1. Callaghan RC, Hathaway A, Cunningham JA, Vettese LC, Wyatt S, Taylor L. Does stage of change predict dropout in culturally diverse sample of adolescents admitted to inpatient substance abuse treatment? A test of the Transtheoretical Model. *Addict Behav*. 2005;30(9):1834-47.
2. DiClemente CC. *Addiction and change: how addictions develop and addicted people recover*. New York: Guilford; 2006.
3. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol*. 1983;51(3):390-5.
4. Migneault JP. Application of the Transtheoretical Model to substance abuse: historical development and future directions. *Drug Alcohol Rev*. 2005;24(5):437-48.
5. Prochaska JO, DiClemente CC. Toward a comprehensive model of change. In: Miller W, Healther N, editors. *Treating addictive behaviors: Processes of change.* New York: Plenum Press; 1986. pp. 4–27.
6. DiClemente CC. Readiness and Stages of Change in Addiction Treatment. *Am J Addict.* 2004;13(2):103-19.
7. Littell JH, Girvin H. Stages of change: a critique. *Behav Modif*. 2002;26(2):223-73.
8. Sutton S. Back to the drawing board? A review of application of the transtheoretical model to substance use. *Addiction*. 2001;96(1):175-86.
9. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. *Am Psychol*.1992;47(9):1102-14.
10. McConnaughy EA, Prochaska JO, Velicer WF. Stages of change in psychotherapy: measurement and sample profiles. *Psychotherapy: Theory, research and practice.* 1983;20(3):368-75.
11. Velásquez MM, Maurer GG, Crouch C, DiClemente CC. Group *Treatment for substance abuse: a stages-of change therapy manual*. New York: Guilford; 2001.
12. DiClemente CC. The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change. *J Consult Clin Psychol.* 1991;59(2):295-304.
13. Segan CJ, Borland R, Greenwood KM. Can transtheoretical model measures predict relapse from the action stage of change among ex-smokers who quit after calling a quitline? *Addict Behavior.* 2006;31(3):414-28.
14. McConnaughy EA, DiClemente CC, Prochaska JO, Velicer WF. Stages of change in psychotherapy: a follow up report. *Psychotherapy*.1989;26(4)
15. Janis IL. *Decision making: a psychological analysis of conflict, choice, and commitment*. New York: Free Press; 1977.
16. Bandura A. Social *foundations of thought and action: a social cognitive theory*. Englewood Cliffs: Prentice-Hall; 1999.
17. DiClemente CC. Changing addictive behaviors: A process perspective. *Curr Directions Psychol Sci*. 1993;2(4):101-6.
18. McConnaughy EA, Prochaska JO, Velicer WF. Stages of change in psychotherapy: measurement and sample profiles. Psychotherapy*: Theory Res Pract*. 1983;20:368-75.
19. Budney AJ. Adding voucher-based incentives to coping skills and motivational enhancement improves outcomes during treatment for marijuana dependence. *J Consult Clin Psychol*. 2000;68(6):1-11.

20. Figlie NB. *Motivação para o tratamento do alcoolismo* [dissertação]. São Paulo: Faculdade de Medicina, Universidade Federal de São Paulo; 2004.
21. Miller WR, Tonigan JS. Assessing drinkers'motivation for change: the Stages of Readiness and Treatment Eagerness Scale (SOCRATES). *Psychol Addict Behav*. 1996;10:81-9.
22. Connors GJ. *Substance abuse treatment and the stages of change: selecting and planning interventions*. New York (NY): Guilford Press; 2001.
23. Ockene JK, Quirk ME, Goldberg RJ, Kristeller JL, Donnelly G, Kalan KL, Gould B, Greene HL, Harrison-Atlas R, Pease J, et al. A resident's training program for the development of smoking intervention skills. *Arch Intern Med.* 1988;148(5):1039-45.
24. Weinstein ND. Stage theories in health behavior: conceptual and methodological issues. *Health Psychol*. 1998;17(3):290-9.
25. Miller WR, Rollnick S. *Motivational interviewing: preparing people to change addictive behavior*. New York: The Guilford Press; 1991.
26. Marlatt G. *Relapse prevention*. New York: Guilford Press; 1985.
27. Davidson R. Prochaska and DiClemente's model of change: a case study? *Br J Addict.* 1992;87(6):821-2.
28. Callaghan RC, Taylor L, Moore BA, Jungerman FS, Vilela FA, Budney AJ. Recovery and URICA stage of change scores in three marijuana treatment studies. *J Subst Abuse Treat*. 2008;35(4):419-26.
29. West R. *Theory of addiction*. Oxford: Blackwell Publishing; 2006.
30. West R. Time for a change: putting the Transtheoretical (Stages of Change) Model to rest. *Addiction*. 2005;100(8):1036-9.
31. Vansteenkiste M, Sheldon KM. There's nothing more practical than a good theory: Integrating motivational interviewing and self-determination theory. *Br J Clin Psychol.* 2006;45(Pt 1):63-82.
32. Markland D, Ryan RM, Tobin VJ, Rollnick S. Motivational interviewing and self-determination theory. *J Soc Clin Psychol*. 2005;24(6):811-31.
33. Jungerman FS. *A efetividade do tratamento breve para usuários de maconha* [dissertação]. São Paulo: Faculdade de Medicina, Universidade Federal de São Paulo; 2005.