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Transtheoretic model in smoking cessation

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ABSTRACT

Smoking is one of the major public health problems and a major cause of preventable diseases. Today there are many ways to combat with tobacco use which is the chief risk factor for avoidable diseases. Pharmacotherapy and other supportive therapies based on motivation and cognitive-behavioral approaches are used in treatment. Among those, concentrating on behavioral changes are gaining more popularity as number of people who stop smoking using behavioral therapies are increasing, so is the interest on psychological models. Transtheoretic model is known as behavioral changes model which is widely used in smoking cessation and developed for the first time by Prochaska and DiClemente. It uses appropriate intervention according to the stage of the individual. According to Transtheoretic model, five stages are to be passed for behavior change. Motivational techniques are important for succesfull passing of a stage and should be structured for preparation to the next stage. Each stage should be evaluated for the transition to the next stage. Transtheoretic model is a significant tool for smoking cessation with its ability to use different models of behavior changes. This flexibilitaly of Transtheoretic model makes the model treatment of choice in different addictions. In this review we focus on the features of Transtheoretic model.

1. Introduction

Smoking is a major public health problem and a major cause of preventable diseases. Smoking kills more than five million people every year which will exceed eight million in 2030 if current trend continues. According to the Global Adult Tobacco Survey 2012 results, prevalence of smoking among men is 41.4% and among women is 13.1% in Turkey (Turkey Statistical Institute, 2012). In contrast to previous years, smoking is increasing among women causing significant problems. Therefore, various preventive and theruapatic measures are taken to curb the dangers of smoking. Pharmacotherapy and other supportive therapies based on motivation and cognitive-behavioral approaches are used in treatment (Manfredi et al., 1999; Bilir, 2005; Le Foll et al., 2005; Karlıkaya et al., 2006; Koyun, 2013).

Behavior modification is a difficult and complex procedure. One of the reasons that behavior change attempts fail is that the person is not ready for change (Prochaska and DiClemente, 1982; Beck Institue, 2012).

One theory or combination of different theories can be applied for behavior change (Arkin et al., 2002). However explanation of health behavior does not seem possible with a single theory. Existing theories are used for understanding of a behavour and planning to change it. Commonly used models are: Health Beliefs Model, Health Focus of Control, Diffusion of Innovation, Pender's Health Promotion Model, Transtheoretical

Model/Stages of Change Model (Redding et al., 2000; Özvarış, 2011).

Transtheoretic model 'TTM' also known as 'stages of change' was developed in 1982 by psychologist James O. Prochaska and Carlo DiClemente (Greene et al., 1999; Özvarış, 2011; Pro-change behavior system, 2012). This model is formed from different psychotherapy theories (Prochaska and Norcross, 2010).

In TTM, change of the behavior stages are; 1-Precontemplation (not ready or thinking of change), 2-Contemplation (getting ready), 3-Preparation (ready), 4-Action, 5-Maintenance. For the success individual should be supported according to the stages and personnel needs (Prochaska and DiClemente, 1982). The superiority of TTM is using models from different theories and moreover it directs the therapies according to the stage of the individual (Prochaska and Velicer, 1997).

Surgeon General of the United States used 'nicotine addicition' term for the first time in 1964, 'very strong addictive substances' in 1979 and 'addictive substance in tobacco is nicotine that causes pharmacological and psychological addiction similar to heroin and cannabis' in 1988 (US Department of Health and Human Services, 1964, 1979, 1988). Cigarette addiction is classified as a chronic disease according to the ICD-10 International Classification of Diseases hence requires treatment (Öztuna, 2005; WHO, 2005).

Transtheoretical model

TTM uses appropriate intervention according to the stage of the individual. Each stage should be evaluated for the transition to the next stage. It could progress linear or spiral pattern hence can return to the previous stage (Erol and Erdoğan, 2007). Giving same treatment information to everyone in different stages leads to resistance therefore is not recommended (Cingözbay et al., 2011). Giving advanced stage treatment informations on the earlier stages leads to the development of resistance when that stage is reached.

Instead of information on treatment approaches and other issues, motivational techniques are recommended for the people who decided to quit smoking. TTM is appropriate for this purpose as methods are chosen for the individual's stage (Velicer et al., 1998). TTM uses many behavioral, cognitive techniques (Miller and Rollnick, 2002).

TTM is uptaded regularly (Prochaska and DiClemente 1983; DiClemente et al., 1985; Velicer et al., 1985; Prochaska and DiClemente, 1986; DiClemente et al., 1991; Velicer et al., 1992; Prochaska et al., 1993; Prochaska et al., 1994; McConnaughy et al., 1998; Prochaska et al., 2001). Contemplation stage is the most important stage for the efficacy of the model. Many factors from the amount of cigarettes to previous quit attempts are important for this stage (Woodruff et al., 2006).

According to the model; person goes through various stages until behavior change. These stages are described with several concepts (Table 1) (Prochaska et al., 1993; Prochaska and Velicer, 1997; Velicer et al., 2000; Cancer Prevention Research Center, 2012; Koyun, 2013).

TTM is increasingly being used for various unwanted behavioral changes including smoking, diet, weight loss, stress management, drug addiction, obesity, routine pelvic examination and condom use. Unwanted behaviors have the potential to affect qulity of life of individuals and public health (Prochaska and DiClemente, 1983; Prochaska et al., 1994; Prochaska and Velicer, 1997).

Stages of change

According to TTM five stages are to be passed for behavior change. Motivational techniques are important for succesfull passing of a stage and should be structured for preparation to the next stage (Velicer et al., 1998).

The individual usually progresses to the next stage but for various resons he may return to a previous stage (relapse). In stopping smoking without assistance these stages often follow spiral patterns. Smokers who reach to Action and Maintenance stages revert to previous stages. Studies indicate that only 5% of those who thought of quitting reach to the maintenance stage. In those who started smoking again, 15% reverts to precontemplation, 85% to Contemplation and preperation stages. In TTM each stage has different properties therefore; completing each stage is important (Anczak and Nogler, 2003). Future stage informations create resistance. In various studies smokers are shown to be in the stages of precontemplation (50-60%), contemplation (30-40%) and preparation (%10-15) (Rodgers et al., 2001). These and other studies suggest that identification of stages is as important as the treatment. Inappropriate treatment for the stages cause failure and creates bad tales before next attempts.

Step 1: Precontemplation (not ready)

In the mind of the person at this stage, there is no thought about changing behavior within six months (Woodruff et al., 2006). The person either does not know the harms of unwanted behavior or does not care. Usually he/she does not like to receive information that will help to change the behavior and escapes. Friends and family pressure may reinforce the behavior rather than avoid it. Becouse of the previous failed change attempt, the morale and motivation is lacking. That leads resistance to change behavior and a serious drop in confidence (Velicer et al., 1998).

Table 1. Structure of The Transtheoretical Model

Structures	Descriptions
Stage of change	
Precontemplation	Not thinking of quitting tobacco in the next 6 months.
Contemplation	Thinking of quitting tobacco in the next 6 months
Preparation	Thinking of taking action within 30 days
Action	Changed the behavior within the past 6 months
Maintenance	Behavior change more than 6 months
Decisional Balance	
Gains	Benefits of change
Costs	Costs of change
Self-Efficiacy	Self confidence to maintain healthy behavior when face temptation in trying situations
Process of change	
Experiential	
1. Consciousness Raising [Increasing awareness]	Get the Facts *"I recall information people had given me on how to stop smoking"*
2. Dramatic Relief [Emotional arousal]	Pay Attention to Feelings *"I react emotionally to warnings about smoking cigarettes"*
3. Environmental Reevaluation [Social reappraisal]	Notice Your Effect on Others *"I consider the view that smoking can be harmful to the environment"*
4. Social Liberation [Environmental opportunities]	Notice Public Support *"I find society changing in ways that make it easier for the nonsmoker"*
5. Self Reevaluation [Self reappraisal]	Create a New Self-Image *"My dependency on cigarettes makes me feel disappointed in myself"*
Behavioral	
1. Stimulus Control [Re-engineering]	*"I remove things from my home that remind me of smoking"*
2. Helping Relationship [Supporting]	*"I have someone who listens when I need to talk about my smoking"*
3. Counter Conditioning [Substituting]	*"I find that doing other things with my hands is a good substitute for smoking"*
4. Reinforcement Management [Rewarding]	*"I reward myself when I don't smoke"*
5. Self Liberation [Committing]	*"I make commitments not to smoke"*

Step 2: Contemplation (Getting ready)
The person is aware of the problem and wants to start the behavioral changes within six months. He/she tries to gather information and calculates gains and costs. Unable to take action he searches methods of change. Person can remain in this stage for a long time (Prochaska and Velicer, 1997; Koyun, 2013).

Step 3: Preperation (Ready)
In this stage the person is ready to take action soon (within the next month). There are usually unsuccessful small attempts. In their head they prepare an action (starting a gym, getting professional help or making individual change plan). In this period they fear failure and need support from friends (Prochaska and Velicer 1997; Woodruff et al., 2006).

Step 4: Action
Unwanted problematic behaviors have changed in the last six months and even began to obtain healthy behaviors. In this stage care should be taken to prevent return of the unwanted behavior and get used to the new bevavior. People are generally proud of sharing their success hence increase motivation (Prochaska and Velicer, 1997; Koyun, 2013).

Step 5: Maintenance
The person on this stage is free of unwanted behavior more than six months. The aim is make the bevoviour change permenant. He/she is now more resistant to the unwanted behavior. Therefore, motivation and confidence is increasing. The possibility of a return to the previous steps or changed behavior gets smaller by the time but caution is necessary at all times (Woodruff et al., 2006).

Decisional balance (DB)
One of the key elements in TTM is DB which is evaluation according to costs and benefits, proposed for the first time in 1977 by Janis and Mann (Miller et al., 2001). It is based on comparisons between pros and cons. In the initial stages losses or cons might outweigh the benefits or pros, i.e precontemplation stage. As the stages progress the balance should shift in favor of gains if the intended behavior change be permenant. In the contemplating stage balance should be equal between gains and losses so when the balance tipped towards gains than he/she can move into preparation or action stage. In the maintenance stage gains should outweigh costs in order to prevent relapse.

Self-efficacy
TTM uses self-efficiacy theory of Bandura, 1982. The relation between behavior change and self-efficiacy is defined clearly. Prochaska et al. (1997) described two components in self-efficiacy:

1- Self-confidence is the main component that prevents a return to the previous step or unwanted behavior in relaps triggering situations (Bandura, 1982).
2-Temptation is defined as the degree of desire for relapse.

The balance between these to should be tipped in favour of confidence to prevent relapse. In the precontemplation and contemplation stages temptation is greater than self confidence. But in action stage these are almost equal and behavior change occurs (Plummer et al., 2001). Self-efficiacy is important in all stages. Lack of motivation results in returning previous stages (Miller and Rollnick, 2002).

Processes of change

The methods and techniques used have compatible structures with behavior change stages. The application of methods and techniques is significantly less in the precontemplation stage. Their use increases in contemplation and preparation stages and peaks in action stage. There is a decrease again in maintenance stage. In the early stages cognitive methods are recommended. In later phases (preparation, action, maintenance) behavioral methods are recommended (Cancer Prevention Research Center, 2012). Behavior change is realized using 10 methods; 5 cognitive and 5 behavioral (Tablo 1) (Prochaska et al., 1993; Prochaska and Velicer, 1997; Cancer Prevention Research Center, 2012; Koyun, 2013).

In smoking addiction TTM measurement tools can be considered for evaluation. According to the stages of change, smoking cessation should be planned. Behovior change models should be taught to all health workers and included in the curriculum. By training primary care staff more of the smokers can be reached.

TTM is a significant tool for smoking cessation with its ability to use different models of behavior changes. This flexibilitaly of TTM makes the model treatment of choice in different addictions.

REFERENCES

Anczak, J.D., Nogler, R.A., 2003. Tobacco cessation in primary care: Maximizing intervention strategies. Clin. Med. Res. 3, 201-216.

Arkin, E., Maibach, E., Parvanta, C., 2002. General public: Communicating to Persuade, D., Nelson, R., Brownson, P. Remington, C., (Ed.). Communicating public health information effectivelly, Washington: American public health association. pp: 17-21.

Bandura, A., 1982. Self-efficacy mechanism in human Aaency. Am. Psychologist. 37, 122-147.

Beck Institute, 2012. Cognitive behavior therapy. http://www.beckinstitute.org/what-is-cognitive-behavioral-therapy/?gclid=CIeH9pXD_K0CFQGFDgodzWA8rg. 15.03.2016.

Bilir, N., 2005. Sigara Kullanımının Kadın Sağlığına Etkileri ve Kontrolü. s.1-7. Access: 22.03.2012.

Cancer Prevention Research Center, 2012. Transtheoretical model. http://www.uri.edu/research/cprc/TTM/detailedoverview.htm. Access: 15.03.2016.

Cingözbay, B.Y., Işılak, Z., Tokatlı, A., Uzun, M., 2011. Editöre mektuplar. Anadolu Kardiyoloji Dergisi, 11, 467.

Di Clemente, C.C., Prochaska, J.O., Fairhurst, S., Velicer, W.F., Rossi, J.S., Velasquez, M., 1991. The process of smoking cessation: An analysis of precontemplation, contemplation and contemplation/action. J. Consult. Clin. Psychol. 59, 295-304.

Di Clemente, C.C., Prochaska, J.O., Gibertini, M., 1985. Self-efficacy and the stages of self-change of smoking. Cognit Ther Res. 9, 181-200.

Erol, S., Erdoğan, S., 2007. Sağlık davranışlarını geliştirmek ve değiştirmek için transteoretik modelin kullanılması. Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi. 10, 86-94.

Greene, G.W., Rossi, S.R., Rossi, J.S., Velicer, W.F., Fava, J.L., Prochaska, J.O., 1999. Dietary applications of the stages of change model. J. Am. Diet. Assoc. 99, 673-678.

Karlıkaya, C., Öztuna, F., Solak, Z.A., Özkan, M., Örsel, O., 2006. Tütün kontrolü. Toraks. 7, 51-64.

Koyun, A., 2013. Yetişkin kadınlara değişim aşamaları modeli (transteoretik model) ile yapılan eğitimin sigarayı bırakma davranışı üzerine etkisi. Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü. Doğum, Kadın Hastalıkları Hemşireliği Programı. Doktora Tezi. Ankara. pp: 32-40.

Le Foll, B., Melihan-Cheinin, P., Rostoker, G., Lagrue, G., AFSSAPS, 2005. Smoking cessation guidelines: Evidence-based recommendations of the French Health Products Safety Agency. Eur. Psych. 20, 431-441.

Manfredi, C., Crittenden, K.S., Warnecke R, Engler J, Cho Y, Shaligram C., 1999. Evaluation of a motivational smoking cessation intervention for women in Public Health Clinics. Preventive Med. 28, 51-60.

McConnaughy, E.A., Prochaska, J.O., Velicer, W.F., 1998. Stages of change in psychotherapy-measurement and sample profiles. Psychotherapy: Theory, Research and Practice. 20, 368-375.

Miller, M.P., Gillespie, J., Billian, A., Davel, S., 2001. Prevention of smoking behaviors in middle school students: Student nurse interventions. Public Health Nurs. 18, 77-81.

Miller, W.R., Rollnick, S., 2002. Motivational interviewing. The Guilford Press. New York. London. pp: 274-275.

Öztuna, F., 2005. Sigara bırakma polikliklerinde tedavi ve izlem. J. Med. Sci. 25, 546-550.

Özvarış, Ş.B., 2011. Sağlığı geliştirme ve sağlık eğitimi. Hacettepe Üniversitesi Yayınları. Ankara. pp: 40-59.

Plummer, B.A., Velicer, W.F., Redding, C.A., Prochaska, J.O., Rossi, J.S., Pallonen, U.E., Meier, K.S., 2001. Stage of change, decisional balance, and temptatios for smoking measurement and validation in a large, school-based population of adolescent. Addict. Behav. 26, 551-557.

Pro-change Behavior System, 2012. Transtheoretical Model. http://www.prochange.com/ttm. Access: 28.03.2012.
Prochaska, J.M., Prochaska, J.O., Levesque, D.A., 2001. A transtheoretical approach to changing organizations. Adm. Policy. Ment. Health. 28, 247-261.
Prochaska, J.O., DiClemente, C.C., 1982. Transtheoretical therapy toward a more integrative model of change. Psychotherapy: Theory, Research, Practice. 19, 276-288.
Prochaska, J.O., DiClemente, C.C., 1983. Stage and processes of self change of smoking: Toward and integrative model. J. Consult. Clin. Psychol. 51, 390-395.
Prochaska, J.O., DiClemente, C.C., 1986. Toward a comprehensive model of change. Miller, W.R., Heather, N., Ed. Treating addictive behaviors: Processes of change. Plenum Press. New York. pp: 3-27.
Prochaska, J.O., DiClemente, C.C., Velicer, W.F., Rossi, J.S., 1993. Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. Health Psychol. 12, 399-405.
Prochaska, J.O., Norcross, J.C., 2010. Systems of psychotherapy: A transtheoretical analysis. 7th Ed. Brooks and Cole. pp: 64-73.
Prochaska, J.O., Redding, C.A., Evers, K.E., 1997. The transtheoretical model and stages of change. Glanz, K., Lewis, F.M., Rimer. B.K., Ed. Health behavior and health education: Theory, research, and practice. Jossey-Bass. San Francisco. pp: 60-84.
Prochaska, J.O., Velicer, W.F., 1997. The transtheoretical model of health behavior change. Am. J. Health Promot. 12, 38-48.
Prochaska, J.O., Velicer, W.F., Rossi, J.S, Goldstein, M.G., Marcus, B.H.,1994. Stages of change and decisional balance for 12 problem behaviors. Health Psychol. 13, 39-46.
Redding, C.A., Rossi, S.J., Rossi, R.S., Velicer, W.F., Prochaska, J.O., 2000. Health behavior models. Int. Elec. J. o Health Edu. 3, 180-193.
Rodgers, W.M., Courneya, K.S., Bayduza, A.L., 2001. Examination of the transtheoretical model and exercise in 3 populations. Am. J. Health. Behav. 25, 33-41.
Turkey Statistical Institute, 2012. Global Adult Tobacco Survey . http://www.tuik.gov.tr/PreHaberBultenleri.do?id=13142. Access: 15.11. 2013.
US Department of Health and Human Services, 1964. Reducing the health consequences of smoking: A Report of the surgeon general. Atlanta, Georgia US, Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promontion, Office on Smoking and Health. Surgeon Generals Report. pp: 34.
US Department of Health and Human Services, 1979. Smoking and health: A Report of the Surgeon General. Atlanta, Georgia: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promontion, Office on Smoking and Health. Surgeon Generals Report. pp: 15.
US Department of Health and Human Services, 1988. The health concequences of smoking: Nicotine addiction. A Report of the surgeon general. Rockville, US Department of Health and Human Services, Public Health Service, Centers for Health Promotion and Education. Office on Smoking and Health. DHHS Publication. 88, 8406.
Velicer, W.F., DiClemente, C.C., Prochaska, J.O., Brandenburg, N., 1985. Decisional balance measure for assessing and predicting smoking status. J. Pers. Soc. Psychol. 48, 1279-1289.
Velicer, W.F., Prochaska, J.O., Fava, J.L., Norman, G.J., Redding, C.A., 1998. Smoking cessation and stress management: Applications of the transtheoretical model of behavior change. Homeostasis. 38, 216-233.
Velicer, W.F., Prochaska, J.O., Rossi, J.S., Snow, M.G., 1992. Assessing outcome in smoking cessation studies. Psychol. Bul. 111, 23-41.
Woodruff, S., Lee, J., Conway, T., 2006. Smoking and quitting history correlates of readiness to quit in multiethnic adolescents. Am. J. Health Behav. 30, 663-674.
World Health Organization (WHO), 2005. Tütün kontrolünde sağlık profesyonellerinin rolü. Bilir, N. Ed. Tütünsüz Yaşam Derneği. Ankara. pp:1-20.