

## Original Article

### Applying of theory of planned behavior to promote physical activity and exercise behavior among older adults

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#### Abstract:

Regular physical activity (PA) is foremost important for well-being and independent living in older age. However, recently, more than 75% of older adults have not been involved in any PA/exercise program at the suggested levels. Understanding their perspective towards PA/exercise provide important information in development of interventions for improving their exercise behavior. A conceptual framework that has been successfully applied for exercise behavior is the theory of planned behavior (TPB). The TPB has well shown the relationship between attitudes and PA/exercise behavior directly or indirectly through intention. Attitude, subjective norms and perceived behavioral control are three independent concepts of this theory. In fact, positive attitude, better perceived social pressure, and greater behavioral control result in stronger intention to perform a given behavior. PA/exercise intention is explained more by the TPB constructs in older compared to younger adults. Advancing age is associated with reduction in PA/exercise intention; however, the translation of intention to behavior increases. Furthermore, subjective norm and perceived behavioral control are considered as the strongest determinants of PA/exercise intention among older adults. Hence, the interventions targeting these factors will be valuable in promoting exercise behavior in the elderly.

**Key words:** aging, exercise intention, behavior, psycho-social theory

#### Introduction

The aging of the world's population is a most important demographic phenomenon of the 21<sup>st</sup> century (Armitage & Conner, 2001; Ahmad et al., 2011). It is estimated that by the year 2050 one in every five persons will be old (Mujahid, 2006). Population ageing has become an important challenge for both developed and developing countries (Ahmad et al., 2011), particularly in relation to their health (Nakasato & Carnes, 2006; Singh & Hiatt, 2006; Lin et al., 2010). With advancing age, age-related illnesses, particularly chronic and degenerative conditions and their related disabilities become more obvious (Schulz et al., 2004). In this view, the major public health targets are reducing of frailty and maintaining functional independence in older adults (Landi et al., 2010).

Regular physical activity (PA) or exercise has many lifelong health benefits (Netz et al., 2005; Lautenschlager et al., 2008). It is linked to prevention of chronic diseases (Schutzer & Graves, 2004; Kruk, 2007; Nigg et al., 2009), falls (Heesch et al., 2008), and disability (Wallin et al., 2008) in older age. Furthermore, it is advocated for preventing and optimally managing cardiovascular risk factors and reduction of heart-related death (Akbarbartoortoori et al., 2005; Sofi et al., 2008). Therefore, the more physically active old people are, the less probably to die early (Joseph et al., 2013). Regular PA plays a key role in maintaining and improving the quantity and quality of life (Elavsky et al., 2005; Guedes et al., 2012; Pernambuco et al., 2012). It is also well documented as an essential part of successful aging (Ni Mhaoláin et al., 2012). Generally, there is no other group who can benefit of exercise more than the old population (Breen et al., 2007).

Despite of the overwhelmingly PA-related health benefits, only a small number of old people meet the standard activity level of 30 to 60 minutes per day (Rahimi et al., 2011) and a high proportion of them are not physically active (Vallance et al., 2011). The prevalence of sedentary lifestyle increases with ageing process (Dumith et al., 2011), and it is one of the most important predictors of functional disability among the older adults (Landi et al., 2010). As, in 2010 more than three million deaths around the world were due to an inactive lifestyle (Bull & Bauman, 2011).

Theories are useful for explaining the determinant factors of PA/exercise involvement (Plotnikoff et al., 2010). Despite the number of available psychological theories, there is no agreement for the preeminent model for studying exercise behavior (Maddux & DuCharme, 1997). However, one conceptual framework that has been successfully applied for exercise behavior is theory of planned behavior [TPB; Ajzen (1991)]. The TPB has been applied to predict and understand PA/exercise behavior in different groups of people (Vallance et al., 2011). According to this theory, attitudes and PA behavior are correlated via intention (Grodesky et al., 2006; Vallance et al., 2011). A strong intention is required for being physically active (Stadler et al., 2009).

Given older adults health status gets to be a concern; therefore, a better understanding of the social cognitive correlates of PA/exercise behavior among them could ease the development of proper strategies on PA/exercise change in this group of population. This article, therefore, address the TPB application in understanding PA/exercise intention and behavior in older adults based on some previous studies.

### **Theory of Planned Behavior (TPB)**

This social cognitive theory shows the relationship between attitudes and behaviors. It assumes that individual's attitude towards outcomes of a behavior is an important factor for engaging in that behavior (Kosma, 2012). The TPB (Ajzen, 1991) is an extension of the theory of reasoned action (Fishbein & Ajzen, 1975) by adding the concept of perceived behavioral control to give an explanation for behaviors that are not under a person's control (Ajzen, 1991; Benjamin et al., 2005).

The TPB seems to be a prominent theory for the prediction of health-related behaviors (Armitage & Conner, 2001; Conner & Sparks, 2005; Plotnikoff et al., 2008), such as smoking (Higgins & Conner, 2003), dieting (Nejad et al., 2005), and exercise (Hausenblas et al., 1997; Downs & Hausenblas, 2005; Rhodes et al., 2006). It combines social influences and personal factors as the behavior predictors (Rivis & Sheeran, 2003; Rhodes et al., 2006).

In the TPB, a fundamental and immediate antecedent factor of a behavior is intention that consists of both motivation and planning components (Vallance et al., 2011). Intention reflects one's motivation and willingness for behavior involving (Ajzen, 1991; Hagger & Chatzisarantis, 2005) that is the main and direct determinant of a behavior (Rhodes et al., 2006; Vallance et al., 2011; Kosma, 2012). Furthermore, intentions are explained by three independent concepts, including attitude toward the behavior, subjective norm (perceived social pressure regarding to the particular behavior), and perceived behavioral control (perceived capability for conducting the behavior) (White et al., 2012). Together, these constructs are representative of a person's total motivation for performing the behavior (Kwan & Bryan, 2010). The TPB actually provides a theoretical framework to describe these three elements of intention (Ajzen & Madden, 1986; Dean et al., 2007; Gretebeck et al., 2007). These constructs are effective on the individual's motivation to take part in the behavior (Kwan & Bryan, 2010). Briefly, with a more positive attitude and subjective norm, and better perceived behavioral control, intention to engage the behavior will be more powerful (Lin et al., 2012). Fig.1

### **Attitude**

Attitude is a personal belief (behavioral beliefs) that weighted by the positive or negative evaluations of a behavior consequence (Ajzen, 1991; Conn et al., 2003; Glanz et al., 2008). Perceived outcomes of the behavior and assessment of these outcomes are crucial in the personal attitude (Lin et al., 2012). Attitude has both instrumental (e.g. harmful or beneficial) and affective (e.g. unpleasant or pleasant) components (Plotnikoff et al., 2010; Vallance et al., 2011). Major reported behavioral beliefs for PA among older adults have been weight control, reduced joint rigidity, social relations, and improved quality of life (Antikainen et al., 2010).

### **Subjective Norm**

Subjective norm is defined as the perceived social force that affects the decision to perform the behavior or not (Nigg et al., 2009). It actually reflects a person's perceptions of social approval for performing the behavior (Cooke & French, 2008). It includes both injunctive (subjective) and descriptive components. Injunctive component is the others' view on a behavior performance. However, descriptive component represents the others' behavior that effects on the individual's performance (Vallance et al., 2011; Kosma, 2012). Family members, friends, physicians, and co-workers usually are significant people who their suggestions are important for performing a behavior in the elderly. For instance, if a woman believes that her spouse wants her to exercise, her subjective norm for the exercise will be increased (Ajzen, 1991; Conn et al., 2003; Antikainen et al., 2010).

### **Perceived Behavioral Control (PBC)**

The PBC was included in the theory of reasoned action for description of behaviors that are not completely volitional (Ajzen, 1991). For these behaviors, intention is not a sufficient factor for action. Translating intentions into action are associated with many difficulties, such as distractions, forgetting or

conflicting bad habits that reduce the magnitude of the relationship between intention and behavior (Schwarzer, 2008; Luszczynska et al., 2011).

The PBC construct is similar to the concept of self-efficacy and reflects the degree of individual's control over internal and external obstacles for behavioral performance based on the perceived simplicity or difficulty (Cooke & French, 2008; Vallance et al., 2011; Linke et al., 2013) in earlier experiences. It is also determined by perceived power regarding to the perceived importance of each of factors that facilitate or hinder the action (Ajzen, 1991; Conn et al., 2003; Dean et al., 2007; Lin et al., 2012).

Control beliefs such as availability of resources and opportunities are the main determinants of people's intentions and actions. It may be supported by experience with the behavior, but acquaintances, friends, and others could influence on the effort of performing the behavior. In fact, more resources and opportunities and fewer barriers are determinants of the greater perceived control over the behavior (Ajzen, 1991). In older adults, usual reported control beliefs have been health problems, care for others, pain, cost, and insufficiency of energy, time, or motivation (Courneya, 1995; Eyler et al., 1998; Conn et al., 2003).

As depicted in Figure 1, perceived control is linked to both intentions and behavior. This proposes that the PBC has a motivational effect on intentions, for instance, individuals may desire to perform the behavior, but facing to some insurmountable barriers at the time reduces their intention or vice versa (Andrew Smith & Biddle, 1999).

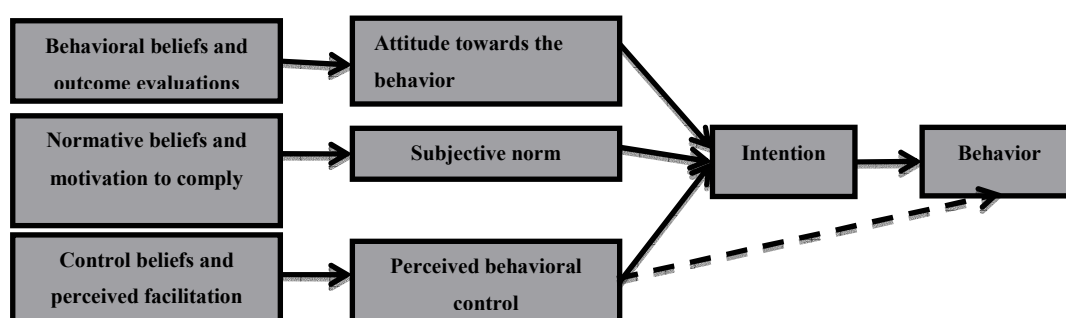


Fig1: Components of the theory of planned behavior (Westaby, 2005)

### The TPB and PA/Exercise in Older Adults

The TPB is a proper theory for application in the study of PA/exercise, as PA is a behavior that potentially has many obstacles and only to some extent is under personal control (Andrew Smith & Biddle, 1999). The TPB therefore has been widely used for predicting and explaining PA/exercise motivation and behavior in the general population (Hausenblas et al., 1997; Biddle & Nigg, 2000; Hagger et al., 2002a; Rhodes et al., 2006; Vallance et al., 2011). Specifically, a handful of studies has applied the TPB for exercise behavior in older adults (Courneya, 1995; Michels & Kugler, 1998; Conn et al., 2003; Benjamin et al., 2005; Lucidi et al., 2006; Dean et al., 2007; Gretebeck et al., 2007; Yardley et al., 2007; Kosma, 2012).

PA/exercise intention is reduced with advancing age (Rhodes et al., 1999; Yardley et al., 2007). Likewise, Yardley et al. (2007) observed a negative relationship between age and exercise intention in older adults. Because, older individuals believe that they are not capable of performing exercises as compared to younger individuals. However, older people are more inclined to translate their intentions to PA/exercise behavior (Hagger et al., 2002b). Downs and Hausenblas (2005) also found a larger intention-behavior contribution for older adults aged 65 to 80 compared to adults aged 26 to 64, and children aged 8 to 17.

Many studies have reported that the TPB constructs account for 39-44% of the variance of exercise behavior in the general population (Hausenblas et al., 1997; Armitage & Conner, 2001; Hagger et al., 2002a; Rhodes et al., 2006; Vallance et al., 2011). However, data from several sources have revealed that the TPB constructs are more applicable in explaining older adults' intention to exercise. For instance, Lucidi et al. (2006); Lin et al. (2012) and Gretebeck et al. (2007) reported that 45%, 55% and 72% of the variance in PA intention in the elderly was explained by the TPB variables, respectively.

Previous studies have emphasized that demographic characteristics may result in different associations of the TPB constructs to the explanation of intention and behavior (Nigg et al., 2009). Generally, effect of each of the TPB constructs will change based on the behavior and the group of population under study (Grodesky et al., 2006; Dean et al., 2007). In younger adults, intention is the strongest predictor of PA, mostly by attitude and PBC with moderate to large effect sizes, and to a less extent by subjective norm, with a small to negligible effect (Hausenblas et al., 1997; Downs & Hausenblas, 2005; Rhodes et al., 2006). In this regards, Hagger et al. (2002b), Hausenblas et al. (1997), and Downs and Hausenblas (2005) in their meta-analysis review reported that subjective norm is considered a weaker predictor of PA/exercise intentions in general population than attitude and PBC. However, subjective norm and PBC have been found as the strongest determinants of exercise behavior intention in older adults (Wankel & Mummery, 1993; Dean et al., 2007). Dean et al. (2007) also

observed that attitude was not a significant effective factor of strength-training intention among older adults. Although, the majority of aged people have positive attitudes towards exercise, and know its beneficial effect for their physic and mind but yet they still do not participate (Costello et al., 2011). The more influence of subjective norm in older age could be associated with the different motivations factors in physical activity attendance in older versus younger adults. For instance, social interaction is the main reason for joining an exercise program in older adults compared to their younger counterparts (Gill & Overdorf, 1994; Allender et al., 2006; Capalb et al., 2012). Physical activity gives older adults an opportunity for connecting with others, so, they may more interest to join in activities in which their important people are also involved.

These findings suggest that awareness of benefits of physically active lifestyle may not necessarily increase older adult's intention to attend an exercise program. So, health promotion programs, which attempt to change older adults' attitudes towards PA/exercise, might not be enough to facilitate participation in the activity. As a result, interventions would be better target to other TPB variables, such as subjective norm and PBC, for effective change. Hence, old people need a highly supportive settings for maintaining exercise behavior (Kosma, 2012). Additionally, it is important to use appropriate effort and type of exercise considering different elders' age groups and levels of physical and mental health conditions. This might help older adults to obtain an increased sense of PBC.

There are some contradictory ideas on the extension of the TPB theory by applying volitional variables such as planning. In this regards, Norman and Conner (2005) illustrated that planning can play the mediator role by facilitating the translation of intention to exercise behavior among undergraduate students. White et al. (2010) also documented that the TPB-centered intervention on exercise behavior is mediated by planning strategies among old people with diabetes and cardiovascular disease. However, Conn et al. (2003) reported that a planned intention cannot always predict the actual performance and might be modified by an unplanned program. For example, a planned intention to swim after work may be changed due to an unexpected meeting. Additionally, Linke et al. (2013) also stated that planning was not affective on habitual behaviors. In this case, even the strongest intentions are not powerful enough to change the everyday habits.

## Conclusion

This paper has given an account of using the TPB theory to enhance PA/exercise behavior in the older adults. In general, the TPB provides a better understanding of the determinant factors of exercise. Previous studies showed that the TPB constructs define more variance of exercise intention in older compared to younger' adults. Subjective norm and PBC have been as the strongest determinants of exercise intention and behavior in the older population. Hence, improvement of attitudes toward a physical active lifestyle might not be sufficient to increase the exercise program involvement. Other TPB variables, such as subjective norm and PBC are required to make PA/exercise behavior change among old population.

## Conflicts of Interest

There are no any conflicts of interest to declare.

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