Comparison of change stages of trans theoretical model (TTM) among health-related field and non health-related field to milk consumption

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Abstract: During last few decades, soft drink consumption has steadily increased while milk intake has decreased. Excess consumption of soft drinks and low milk intake may pose risks of several diseases such as dental caries, obesity, and osteoporosis. Although beverage consumption habits form during young adulthood, which has a strong impact on beverage choices in later life. The aim of this study was to determine and Comparison of stages of transtheoretical model (TTM) among health-related field(HRF) and non health-related field (NHRF) to milk consumption. A significantly higher percentage of HRF than NHRF students self-classified in the action-maintenance stages (15% versus 11%, P = 0.016); also a significantly higher percentage of NHRF than HRF students self-classified in the pre contemplation -contemplation-preparation stage (89% versus 85%, $P = 0.015$)according Mann-Whitney U test.

Key word: trans theoretical model**,** change stages, milk consumption, students.

1. Introduction

Soft drink con-sumption has exploded over the past three decades (Nielsen, 1977) demonstrating a per capita availability increase from 22 gallons to 52 gallons (Gerrior et al, 1998; Jacobson, 2005). Sugar sweetened soft drinks became a major source of added sugar in the American diet (Bray et al, 2004 ; Gurthrie et al, 2000) and have been linked to adverse nutritional and health consequences such as dental caries and obesity (Bray et al, 2004;. Heller K et al,2001; Ma et al, 2004 ; Ludwig et al, 2001; Tam et al, 2006; Schulze et al, 2004; Raben et al, 2002). Furthermore, evidence also supports an association between soft drink consumption and decreased bone mineral density (BMD) (Ma et al, 2004 ;Wyshak,2000; McGartland et al,2003). Milk and other dairy products are the major source of dietary calcium contributing to about 70% of the calcium in the U.S. food supply (Gerrior et al, 1998). Sixty years ago, Americans drank more than four times more milk as compared to soft drinks, but 2 1/3 times more soft drinks were consumed than milk by 1998 (Gerrior et al, 1998). This trend demonstrates a possible displacement of milk intake (Rampersaud et al,2003). This relationship is most prevalent in adolescents and young adults (Wyshak,2000). Sufficient intake of calcium, especially during adolescence and young adult- hood, is important to maximize peak bone mass (PBM). Failure to achieve PBM increases the incidence of osteoporotic fracture later in life (Matkovic et al, 1979).

Today, a century later and in a very different socio- economic setting, the long-term effect of childhood milk consumption on growth is still debated.

There is, however considerable evidence that milk stimulates longitudinal growth in certain populations, even in recent studies (Takahashi, 1984; Hoppe et al, 2006; Wiley,2005; Bogin,1988). Non-caloric components of milk, especially insulin-like growth factor I (IGF-I), are widely held to account for the growth stimulating effect of cow's milk in industrialised countries (Takahashi, 1984, Hoppe et al,2004a ; Hoppe et al,2004b; Berkey et al, 2009; Zhu et al, 2008a; Zhu et al, 2008b; Du et al; 2002).

There is a significant need to identify avoidable causes of cancer. Extensive research has been conducted on various aspects of diet, such as intakes of fat, meat, fruits and vegetables, and micronutrients. Dairy products in general and milk in particular, have also been examined in relation to cancer risk. Among women, consumption of milk may decrease risk of colorectal cancer (Norat and Riboli, 2003) and cervical cancer (La Vecchia et al, 1988), but have no effect on breast cancer e.g., (Moorman and Terry,2004; Bandera et al, 2007) or endometrial cancer (Bandera et al,2007). Results for lung cancer are quite mixed, with some studies suggesting risk reduction e.g., (Kubik et al,2004) or risk enhancement e.g., (Mettlin,1989) that may vary by gender (Nyberg et al, 1998) or the histology of the tumor (Axelsson and Rylander, 2002). A recent review on ovarian cancer concluded that consumption of low-fat milk is protective (Schulz et al,2004), but a pooled analysis of 12 cohort studies observed an elevated risk associated with increased lactose intake (Genkinger et al,2006).

Programs for adolescents hold the promise of establishing healthy eating habits that may persist into

adulthood (Kelder et al, 1994). Developing such programs requires the identification of theories that inform understanding of the process of health-behavior change. The transtheoretical model (TTM) provides an integrative framework for understanding this process (Prochaska and Velicer, 1997). According to the TTM, health behavior change involves progression through five stages:

 (1) *pre contemplation,* no intention of changing behavior in the foreseeable future (defined as the next 6 months);

(2) *Contemplation,* intending to change within the next 6 months;

(3) *Preparation,* intending to change within the immediate future (defined as the next month); (4) *action,* behavior change has been made within the past 6 months; and

(5) *Maintenance,* changes have been made and sustained for 6 months or longer.

The Transtheoretical Model (TM), originally used by Prochaska and Di Clemente (Prochaska and Di Clemente, 1982) as a conceptual framework for the study of addictive behaviors, has since been used successful to identify correlates of healthy eating for use in clinical and educational settings (Schunk et al, 2009; Ôunpuu et al, 1999; Lea et al, 2006; Chung et al, 2006).

The aim of this study was to determine and Comparison of stages of transtheoretical model (TTM) among health-related field (HRF) and non health-related field (NHRF) to milk consumption.

2. Materials and Methods

Convenience sampling was used to recruit undergraduates at high-traffic locations (i.e., student union, residence halls, dining rooms, outside the library) at Islamic Azad University (IAU). In this study 200 college students 18-24years of age were taken (100 health-related fields (HRFs) and 100nonhealth-related fields (NHRFs).

Informed consent was explained in a cover letter attached to each questionnaire, no incentives were offered for participation, and receipt of a completed questionnaire was interpreted as obtaining informed consent. Confidentiality of responses was insured by storing the questionnaires in a locked filing cabinet in the office of one of the investigators. This research was approved by the Islamic Azad University. Data were collected over a three-month period using an anonymous, self-administered questionnaire that was completed at the recruitment sites. The staging measure and algorithm developed by the National Cancer Institute was used to assess respondents' stage of change for milk consumption(Thompson et al,1994). Milk consumption was measured by self-report using the first item in the staging measure. Response options included five categories with a range from 0 to 4 and

more servings. For data analysis purposes, milk consumption was converted to a continuous variable by assigning participants the midpoint of the range of values corresponding to their original response choice. Descriptive statistics were used to generate a demographic profile of respondents and to examine their stage distribution and milk consumption.

3. Results

Completed questionnaires were received from 200 college students, of whom $n = 100$ (50%) were HRF students and $n = 100$(50%) were NHRF students. The gender distribution among the HRF students was100 females (100%), and among the NHRF students was 25males and 75 females (25% : 75%).

The HRF students were distributed across pre contemplation (18%), contemplation (22%), preparation (45%), action (10 %) and maintenance (5%) stages of change. The NHRF students were distributed across predominantly pre contemplation (28%), contemplation (24%), preparation (37%), action (7%) and maintenance (4%) stages of change. For data analysis purposes, pre contemplation and contemplation was combined with preparation ;and action was combined with maintenance. According to the revised classification, the largest proportion of HRF students was in the pre contemplation -contemplation-preparation stage (85%), and action-maintenance (15%) stages; and the largest proportion of NHRF students was in the pre contemplation -contemplation-preparation stage (89%) and action-maintenance (11%) stages. The HRF Participants' mean (SD) level of consumption was 1.64 (1.13) servings. Less than 10% of participants consumed the recommended 3 glass and more daily. The NHRF Participants' mean (SD) level of consumption was 1.44 (1.19) servings. Less than7% of participants consumed the recommended 3 glass and more daily. A significantly higher percentage of HRF than NHRF students self-classified in the action-maintenance stages (15% versus 11%, $P = 0.016$); also a significantly higher percentage of NHRF than HRF students self-classified in the pre contemplation -contemplation-preparation stage (89% versus 85%, $P = 0.015$)according Mann-Whitney U test. The mean of milk consumption in HRF students significantly higher than NHRF students (1.64 glass versus 1.44glass, p=0.032) according Mann-Whitney U test.

4. DISCUSSION

This study showed that HRF students (85%) and NHRF students (89%) were distributed predominantly across pre contemplation, preparation andpreparation stages of change. This findings are agreement with study of Di Noia and et al (Di Noia et al, 2006). This is one of the first studies to examine the application of the TTM to milk consumption among Iranian students. the concentration of students in pre contemplation, contemplation and preparation stages, followed by

action-maintenance stages. There is a tremendous need for interventions to increase milk consumption among this population. That most participants were in contemplation-preparation stages suggests that, temporally, they are prepared to take action to improve their diets in the near future and are therefore ready for intervention. Health professionals designing programs to increase milk consumption among this population should address the lower pros and self-efficacy for change and higher cons of change characteristic of youths in this stage. Although the TTM suggests that youths in preaction stages of change can benefit, from exposure to experiential vs. behavioral change strategies for modifying their dietary behavior, conclusions regarding which strategies are effective in promoting forward movement to action-maintenance among students must await further research. A limitation of this study is that a convenience sampling. In addition, possible confounding factors, such as seasonal variation in beverage consumption, were not controlled for.

Acknowledgment

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