

Evaluation of change stages of transtheoretical model (TTM) among college student to milk consumption

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Abstract: The transtheoretical model (TTM) provides an integrative framework for understanding process involved in dietary behavior change. 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 nursing and art student to milk consumption. A significantly higher percentage of nursing than art students self-classified in the action- maintenance stages (17% versus 12%, $P = 0.016$); also a significantly higher percentage of art than nursing students self-classified in the pre contemplation - contemplation-preparation stage (88% versus 83%, $P = 0.015$) according Mann-Whitney U test.

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1. Introduction

Adolescence consumes a high level of carbohydrate drinks and this may have significant adverse effects for their health's. Soft drink consumption has exploded over the past three decades (1) demonstrating a per capita availability increase from 22 gallons to 52 gallons (2, 3). Sugar sweetened soft drinks became a major source of added sugar in the American diet (4,5) and have been linked to adverse nutritional and health consequences such as dental caries and obesity (4,6-11). Furthermore, evidence also supports an association between soft drink consumption and decreased bone mineral density (BMD) (7, 12, 13). 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 (2). 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 (2). This trend demonstrates a possible displacement of milk intake (14). This relationship is most prevalent in adolescents and young adults (12). 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 (15).

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 (16-19). 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 (16, 20-25).

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 (26) and cervical cancer (27), but have no effect on breast cancer e.g., (28,29) or endometrial cancer (29). Results for lung cancer are quite mixed, with some studies suggesting risk reduction e.g., (30) or risk enhancement e.g., (31) that may vary by gender (32) or the histology of the tumor (33). A recent review on ovarian cancer concluded that consumption of low-fat milk is protective (34), but a pooled analysis of 12 cohort studies observed an elevated risk associated with increased lactose intake (35).

Programs for adolescents hold the promise of establishing healthy eating habits that may persist into adulthood (36). 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 (37). 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 (38) as a conceptual framework for the study of addictive behaviors, has since been used successfully to identify correlates of healthy eating for use in clinical and educational settings (39–42).

The aim of this study was to determine and compare stages of transtheoretical model (TTM) among nursing and art students 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 18-24 years of age were taken: 100 nursing and 100 art students.

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 (43). 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 nursing students and $n = 100$ (50%) were art students. The gender distribution among the nursing students was 100 females (100%), and among the art students was 25 males and 75 females (50% : 50%).

The nursing students were distributed across pre contemplation (18%), contemplation (22%), preparation (43%), action (11%) and maintenance

(6%) stages of change. The art students were distributed across predominantly pre contemplation (28%), contemplation (24%), preparation (36%), action (8%) 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 nursing students was in the pre contemplation - contemplation-preparation stage (83%), and action-maintenance (17%) stages; and the largest proportion of art students was in the pre contemplation - contemplation-preparation stage (88%) and action-maintenance (12%) stages. The nursing students' mean (SD) level of consumption was 1.64 (1.13) servings. Less than 10% of participants consumed the recommended 3 glasses and more daily. The art students' mean (SD) level of consumption was 1.44 (1.19) servings. Less than 7% of participants consumed the recommended 3 glasses and more daily. A significantly higher percentage of nursing than art students self-classified in the action-maintenance stages (17% versus 12%, $P = 0.016$); also a significantly higher percentage of art than nursing students self-classified in the pre contemplation - contemplation-preparation stage (88% versus 83%, $P = 0.015$) according to Mann-Whitney U test. The mean of milk consumption in nursing students was significantly higher than art students (1.64 glasses versus 1.44 glasses, $p = 0.032$) according to Mann-Whitney U test.

4. DISCUSSION

This study showed that nursing students (83%) and art students (88%) were distributed predominantly across pre contemplation, preparation and preparation stages of change. These findings are in agreement with the study of Di Noia and et al (44). 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.

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