

Nutritional Knowledge and Attitudes Towards Healthy Eating of College-going Women Hockey Players

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ABSTRACT The purpose of this study was to determine the nutritional knowledge of female collegiate hockey players and how effectively they apply their nutritional knowledge to their everyday eating habits. The sample studied included female hockey players (n=30) from different college teams of Haryana in the age group of 17-23 years. The instrument was a self-administered questionnaire designed to assess nutritional knowledge and attitudes of the subjects. The mean score on nutritional knowledge test was 22.85/55 (38.80% Correct). While incorrect and uncertain responses accounted for the majority of answers, the lowest correct responses were recorded for fiber and energy (21.4 and 25.9% respectively). The attitude towards gaining nutrition information was very positive (93.3 %) but a massive impact of family food habits was observed. This study suggests that athletes lack knowledge of nutrition, healthy food choices, components of a well-balanced diet, and the implications of nutrition on performance. The results can be used to develop training seminars and educational materials to promote greater nutritional knowledge and healthy attitudes among players.

INTRODUCTION

Participation of the girls in sports has increased significantly over the years. Unfortunately, increased participation in women athletics came without an understanding of the specific needs of the female athlete. Physiologic differences in females, combined with internal demands and external pressures during sports activities, have led to health problems and injuries occurring uniquely in the female players. Female players' emphasis often is not only on skill and endurance but also on leanness and appearance (Dunn 2007; Ziegler 1988; Nattiv 1977). Hence, these players are susceptible to what has become known as the female athlete triad of disordered eating, menstrual dysfunction, and osteoporosis (Rastmanesh 2007; Messina 1999). Nutrition is an important complement of any physical fitness program. Good nutrition is not only important to help improve performance but also to promote healthy dietary practices in the long-term (Jonnalagadda et al. 2001).

Nutritional misinformation can do as much harm to the ambitious athlete as good nutrition can help. Many studies quote that female athletes have limited knowledge of nutrition and females do not use their knowledge in making proper food choices (Rastmanesh

2007; Chapman 1997). The Dietetic Associations around the world recommend that athletes of all ages in organized sports engage in healthful and balanced nutrition practices that promote optimal growth along with performance (Ozdođan 2011; Loud 2003). However, the average adolescent athlete does not consume the adequate nutrients necessary for a well-balanced diet (Hickson 1987). Also, the adolescent athlete does not score any better on nutritional knowledge than their non-athlete counterpart (Mitchell 2004; Pirouznia 2001).

Hockey is the national game of India and Haryana has given six players in women national team including the Captain, Mamta Kharab. In between 2002-04, Indian women won Gold for three consecutive years and were named 'Golden girls of hockey' but were eliminated from Beijing Field Hockey Olympic Qualifier in 2008. The Hindustan Times revealed that 16 days before leaving for the games, a report found many of the players to be unfit for international competition. The report was quoted as stating, "Eleven girls are suffering from different injuries and are under treatment and thus not fit for international competition of Olympic qualifying standards." Such news led the researcher to think critically and the present study was undertaken.

The purpose of this study was to assess the nutritional knowledge and attitudes of the female college level hockey players about healthy eating. In addition to this, to identify the areas lacking in nutritional knowledge important in performance and healing so that female players, coaches and health professionals including athletic trainers may then be informed of these critical areas and nutritional intervention can be targeted.

MATERIALS AND METHODS

In this study, the instrument was a well structured questionnaire designed to assess nutritional knowledge and attitudes of female players. Components of the questionnaire included 55 Likert-scale true-false questions and 06 open-ended questions. The questionnaire was developed using carefully selected questions from questionnaires created by Barr (1986) and Werblow et al. (1978). Reliability ($r=0.82$) and construct validity have been determined for the questionnaire by Barr (1986) when used in its entirety. The questionnaire by Werblow et al. (1978) has been used in several studies. However, there is no mention of reliability or validity in the research. Few questions were modified to assess the components of nutritional knowledge and attitude of the Indian female players that were not addressed by either questionnaire.

The questionnaires were completed at university grounds and hostels where these players were available during inter-college matches.

Components of the questionnaire consisted of:

- ❖ Age, course of study, training workshops attended, level of player (College, University, National and International)
- ❖ Source of nutrition information
- ❖ Nutritional knowledge statements regarding energy, carbohydrates, proteins, fats, vitamins, minerals, water, functional foods, sports supplements and drinks with 2–13 true/false statements per subject area
- ❖ Attitude towards healthy eating

The questionnaire was reviewed for content validity and for content clarity before administration. It was pretested on five subjects and administered in totality as no modifications were required.

The responses of the players were recorded on five point Likert Scale to indicate the degree in terms of Strongly agree(5), Agree(4), Undecided(3), Disagree(2) and Strongly disagree(1). For analysis of questions “strongly agree” and “agree” were combined as positive responses and “strongly disagree” and “disagree” as negative responses.

Frequencies were calculated for all knowledge and attitudes questions. Statistical analyses were performed using SPSS for Windows (version 12).

Subjects

Female hockey players ($n=30$) between 17–23 years selected in the college teams to play at inter-college level under Kurukshetra University were questioned. The available subjects were approached personally with the permission from Director, Sports during inter-college matches at Kurukshetra University sports ground. Players were fully informed of the purpose and procedures of the investigation and provided consent at the outset.

RESULTS AND DISCUSSION

Profile of Subjects

The mean age of subjects was 19.9 ± 2.7 years, Body Mass Index (BMI) $=22.5 \pm 1.3$ Kg/m². As indicated in Table 1, majority of subjects (73.3%) were studying in BA (Bachelor of Arts) with physical education as an elective subject, 23.3% in BA with varied subject combinations and 3.33% in B.Sc. (Bachelor of Science) indicating that players normally opt for BA and physical education as an elective subject. The reason cited by most of the subjects was that they get plenty of time to play with this subject combination.

Table 1: Course of study

Course	n (%)
BA (Physical education)	22(73.3)
BA with varied subject combinations	07(23.3)
B.Sc.	01(3.3)

A very large number of the subjects (93.3%) had participated in sports training workshops and the remainder were waiting to

participate in such programs. Amongst these players, 26.6% of the subjects had participated and won laurels at the international level. Players admitted that they did not try to obtain nutritional information and were never imparted any nutrition education. Whatever little they knew, they gathered from a variety of sources. The top four reported sources were parents, magazines, TV and teammate (Table 2). Only 13.3% (4 of 30) cited the athletic trainer, and just fewer than half 43.3% (11 of 30) reported their parents and siblings as a source of nutritional information. The most astonishing fact brought to the notice was that they had never heard about a dietitian.

Table 2: Source of nutrition information

<i>Source of nutrition information</i>	<i>No. of players (%)</i>
Magazines/ Newspapers/Books	08 (26.6)
Family members	11 (43.3)
Coaches	04 (13.3)
Friends	07 (23.3)
School/College	03 (10)
Television/Radio	08 (26.6)
Dietitians	0 (0)

Nutritional Knowledge Assessment

Among the 55 nutrition knowledge statements divided in 11 subsections, mean percentage of correct response was 22.85 (Table 3). While incorrect and uncertain responses accounted for the majority of answers, the lowest correct responses were recorded for fibre and energy (21.4 and 25.9% respectively).

Analysis of individual questions revealed multiple responses in which fewer than 23% of players responded correctly. Several of these questions related directly to nutrition for the athlete: topics including the sources of nutrients, nutrients and performance, and nutritional requirements for female players.

The results indicated that knowledge of participants about carbohydrates, vitamins, weight management and sports nutrition was fairly poor ranging between 32-40, poor about proteins, minerals and functional foods, between 40-45 (Mean percentage of correct responses).

Mainly two topics of fats and hydration got almost half correct answers. One topic area

Table 3: Nutrition knowledge components (N = 30)

<i>Scale</i>	<i>Mean correct / Total questions</i>	<i>Per cent correct responses (%)</i>
1. Energy	0.52/2	25.9
2. Carbohydrates	0.83/2	37.7
3. Protein	1.1/3	41.1
4. Fats	2.2/4	53.5
5. Vitamins	2.7/7	39.3
6. Minerals	4.5/10	43.8
7. Hydration	3.7/7	51.6
8. Weight management	0.95/3	32.3
9. Sports nutrition	4.3/12	36.5
10. Fibre	0.45/2	21.4
11. Functional foods	1.6/3	43.8
Total	22.85/55	38.80

that needs improvement is regarding carbohydrate needs; most athletes incorrectly believed that carbohydrates should be decreased in the diet. Athletes in the current study displayed impressive knowledge regarding fat content of specific foods. However, they lacked knowledge about saturated, poly unsaturated and mono unsaturated fats. They were aware that whole grains contain more vitamins and minerals than do other grains.

Players had problems translating their knowledge into food choices. Only 50 per cent of the survey questions regarding food choices were answered correctly. Malinauskas et al. (2007) pointed out that marketing may be a contributing factor to the confusion of healthy food choices versus non-healthy food choices indicating that there is considerable need for providing sound nutritional education to female players. Few subjects were not even aware about readymade energy, protein and sports supplements. The questions related to fats, iron, calcium and hydration got maximum positive responses. Specifically the questions related to iron, 'Iron deficiency anemia results in decreased activity and performance', 'female athletes who do not eat to remain slim are at a higher risk for iron deficiency', 'due to menstruation, females need more iron in their diets than men' were answered well but were not aware about iron sources. The female participants seemingly knew that dehydration can impair physical performance but lacked knowledge about isotonic, hypertonic and hypotonic sports drinks.

The participants could not answer most of the sports specific nutrition questions and

questions on fiber (response 21.4 mean correct percentage) such as ‘cereals and pulses are the only food group that is a good source of fiber’ and ‘fiber in the diet may help to decrease constipation, decrease blood cholesterol levels, and prevent cancers’. The players failed to identify their hydration requirements and believed thirst to be the only indicator.

The overall results of this knowledge assessment survey revealed a lack of nutritional knowledge among female college hockey players.

Table 4: Nutrition attitude of players

<i>Factor</i>	<i>Agree (% respo- nses)</i>	<i>Disagree (% respo- nses)</i>
Nutrition is very important for players	100	Nil
Food has big impact on performance	93.33	3.33
A player must eat 5 times a day	86.66	3.33
Training diet is more important than competition meal	10.0	73.33
You believe that certain foods are good and few bad for players	86.66	3.33
As a player you must avoid high fat foods	0	100
You should not eat lot of sweets	10	90
Snacks are good source of energy	60	23.33
Cold drinks provide high instant energy	43.33	43.33
Athletes have extra requirements for vitamins and minerals	83.33	16.66
Need for vitamins and minerals increase with activity level	86.66	10

Nutrition Attitude Assessment

Most of the study subjects (86.66%) agreed that female players must eat at least five meals a day and not all foods are good or bad for athletes. Majority of the players (73.33%) were not able to identify the fact that training diet and competition meals are equally important and that a pre-game meal three to four hours before the event allows for optimal digestion and energy supply.

Majority of the players disagreed that they should not eat lot of fat and sweets but they appeared to have been more influenced by the family belief that fat, sugar and jaggery are most essential to provide energy to athletes. In a previous study by Chapman et al. (1997), it was reported that two-thirds of adolescent runners thought little or no fat in the diet was best. But in this study, cent per cent players disagreed with the statement, “As a player you must avoid high fat foods.” Therefore, education for players should include the role and necessity of fat in the body. It was also observed that almost equal number of subjects agreed and disagreed that soft drinks are a source of instant energy. An important finding is that 60 per cent players considered snacks as good source of energy and consequently indulged in junk food eating harming their health and performance.

Players in this study appeared knowledgeable about the need for vitamins and minerals. Most of the players agreed with the statements, “Athletes have extra requirements for vitamins and minerals” and “Need for vitamins and minerals increase with activity level.”

The mean of players’ total positive responses for the attitude component was 90.6%. When they were asked to elucidate the positive impact of providing nutrition education on the food selection, around 93.3% (28 of 30) responded affirmatively. Also, the same number believed that learning facts about nutrition is the best way to achieve favorable changes in food habits. Research has demonstrated that athletes are interested in nutrition information (Froiland et al. 2004; Zawila et al. 2003; Palumbo 2000).

Food Habits and Beliefs

Almost all the players had adopted the family food habits and beliefs. They strongly believed that an athlete must consume lot of ‘Desi Ghee’ and milk to acquire extra energy needed to play. The cultural influence was also very evident from their hot and cold food concepts. The subjects categorized meat, egg, fish, poultry and ghee as hot and most of the fruits as cold except mangoes and dates. It was also reported that during menstruation girls should avoid cold foods. They also

agreed that male members in the family either players or non-players got the best and choicest foods first whereas the females are served leftovers afterwards.

It was observed that college athletes encounter numerous barriers that can hinder healthy eating, including insufficient financial resources to purchase healthy foods, limited meal planning and preparation skills, and travel schedules necessitating “eating on the road” (Malinauskas et al. 2007; Barr 1987).

Poor nutritional habits contribute to the development of the female athlete triad and other health problems. Female athlete triad is a syndrome in which eating disorders (or low energy availability), amenorrhoea/oligomenorrhoea and decreased bone mineral density (osteoporosis and osteopenia) are present. Also, known simply as the Triad, this condition is seen in females participating in sports that emphasize leanness or low body weight. The Triad is a serious illness with lifelong health consequences and can potentially be fatal (Hoch 2009).

The qualitative analysis revealed several themes for food selection and choices. Food preference, recommendation by peer or family, body appearance and weight issues were the top 3 themes. The players’ statements included, “I feel the less you weigh, the faster you run,” “When you have low body weight, you perform better and it helps in selection in better category”, “If you know more about nutrition, you are more likely to make more healthy food choices,” and “I want to eat better, but I really don’t know how,” making it evident that players are very interested to know about nutrition and they will be receptive to nutrition education.

CONCLUSION

Proper nutrition is considered a significant determinant of athletic performance; other than limits from heredity and training, no single factor plays a greater role in optimizing performance than diet.

Based on the result of the study, one may conclude that female hockey players at college level in Haryana are not knowledgeable about nutrition. They lack knowledge of making better food choices and are influenced by trainers, family and peers or, eat whatever is given to them.

In this study, qualitative analysis revealed physical appearance and weight control issues as some of the prime reasons affecting food selection. Thus, the areas of nutritional-knowledge deficits and body figure should be targeted while educating female players.

This further indicates a need to incorporate ‘nutrition education’ as integral part of the curriculum. The general survey indicates that the players are eating fast foods, junk food, and soda sparingly. Because of their activity level, players need to be more aware of their food intake and requirements. The food that is eaten affects their athletic performance, which means that they have to have proper nutrients and energy to perform at optimal levels. Moreover, female players demonstrated positive attitude towards nutrition information, indicating that this population of athletes may be receptive to nutrition education.

The nutrition knowledge of trainers/coaches has a significant impact on the nutritional status thereby the performance of athletes. Therefore, the role of the athletic trainer should include educating athletes on the importance of nutrition in performance and healing. The athletic trainer should be aware of areas of nutritional knowledge deficits in players and be qualified to formulate a plan of intervention through preseason seminars, handouts, posters, and individual counseling.

RECOMMENDATIONS

Sports nutrition has grown manifold over the past. The food players eat always influence performance during practice or competitive events. For this reason and given the results of this study, it would be beneficial to hire a nutritionist as part of the staff. Coaches can help to enhance the performances of their athletes by promoting good nutrition however, they need to have the nutritional knowledge in order to encourage healthy food choices.

It is practical to consider that college athletes are knowledgeable about the demands of their individual sports and the nutrients vital to maintain a healthy and competitive state. Extensive research is needed regarding the effects of nutrition intervention on knowledge, attitudes, and food behavior.

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