Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2320-7051.6499

ISSN: 2320 – 7051

Int. J. Pure App. Biosci. **6 (3):** 518-524 (2018)

International Journal of Pure & Applied Bioscience

Research Article

OPEN ACCESS

Nutrition Knowledge and Awareness of Parents of Lactose Intolerant Children: The Impact of Child-Targeted Nutrition Counselling

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Received: 20.05.2018 | Revised: 24.06.2018 | Accepted: 29.06.2018

ABSTRACT

Nutrition knowledge and awareness of parents of Lactose Intolerant Children was evaluated by selecting 60 lactose intolerant children (1-5 yrs) from different hospitals of Punjab. The requisite data were collected using personal interview schedule. The nutrition interventions like personal counselling, education through lecture-cum-discussion, demonstration of lactose free recipes were imparted to the parents for three months. An educational material was prepared in the form of a booklet-"Understanding Lactose Intolerance" covering various aspects of lactose intolerance which was then given to the parents for further reference. Upon critically analyzing the knowledge level of the parents, it was found that all of the parents had some theoretical knowledge about the disease but this awareness was masked with food myths and taboos. They knew that lactose intolerance affects the gastro intestinal tract of the patient, but they lacked practical knowledge regarding the correct food choices for lactose intolerant children. Overall it was found that the mean knowledge score of the parents before the intervention was 12.56 ± 3.92 which significantly increased to 16.6 ± 4.28, indicating a positive impact of the intervention on the knowledge level of the parents regarding the lactose intolerance. The results revealed that after nutrition counselling the percentage of parents in high knowledge score category increased from 26.67% to 40.00%.

Key words: *Lactose intolerance, Nutrition counselling, Knowledge level, Food choices.*

INTRODUCTION

Lactose is a disaccharide found naturally in milk and other dairy foods. During digestion, the intestinal enzyme, lactase, breaks down lactose into the simple sugars, glucose and galactose, for absorption into the bloodstream. Most people produce sufficient amounts of lactase at birth and during childhood to digest normal amounts of dietary lactose[1]**.** However, sometime after two years of age, intestinal lactase activity begins to decline in some individuals[2]. The symptoms include cramps, flatulence, nausea, abdominal pain, gas, gut pain, bloating, diarrhea, headache, severe fatigue, cognitive dysfunction, muscle and joint pain[3]. Milk avoidance is a significant risk factor for low bone density.

Cite this article: Sachar, S. and Sharma, S., Nutrition Knowledge and Awareness of Parents of Lactose Intolerant Children: The Impact of Child-Targeted Nutrition Counselling., *Int. J. Pure App. Biosci.* **6(3):** 518-524 (2018). doi: http://dx.doi.org/10.18782/2320-7051.6499

Patients diagnosed as lactose intolerant must be advised of "risk" foods, inadequately labelled, including processed meats, bread, cake mixes, soft drinks, and lagers[4]. The dairy food group (milk, cheese, yogurt) is a substantial contributor of essential nutrients such as calcium, potassium, phosphorus, magnesium, zinc, high-quality protein, vitamin A, vitamin D, vitamin B12, and riboflavin. Lactose malabsorption is not a risk factor for osteoporosis if intakes of calcium and other bone-building nutrients are adequate[5]. 'Adaptation' of the microflora also improves tolerance and may be achieved by drinking milk regularly over an extended period of time. An ideal strategy is to drink milk in small amounts with food regularly[6].

Most lactose intolerant subjects can tolerate around 10 g of lactose in milk products per serving[7]. Lactose presented in a solid food may be less likely to induce symptoms than an identical load of lactose presented in solution. One relevant factor may be the rate of gastric emptying, so the fat content of the food or drink consumed may slow the entrance of lactose into the small intestine[8]. The lactose in yogurt is digested more efficiently than other dairy sources of lactose because the bacteria inherent in yogurt assist with its digestion. The increasing pH as the yogurt enters the small intestine and a slower gastrointestinal transit time allow the bacterial lactase to be active, digesting lactose from yogurt sufficiently to prevent symptoms in lactose-intolerant people. There is little difference in the lactase capability of different commercial yogurts, because they apparently contain Lactobacillus bulgaricus and Streptococcus thermophilus in sufficient quantities (108 bacteria/mL). However, Lactobacillus acidophilus appears to require cell membrane disruption to physically release the lactase. Compared with unflavored yogurts, flavored yogurts appear to exhibit somewhat reduced lactase activity but are still well tolerated[9].

Lactose-reduced and "lactose-free" milk and milk products are commercially available. Individuals need to adapt their lactose consumption to their individual tolerance[10]. Reasons attributable for better digestion of cultured milk products than milk are reduction in lactose content, increase in microbial lactase enzyme, stimulation of host's mucosal lactase activity and slower transit of cultured milk products as compared to milk. Therefore consumption of cultured milk products by lactose- intolerant recipients is suggested[11]. Management of lactose intolerance globally will require both education and product development[12]. The present study was undertaken with an objective to study the impact of nutrition counseling on the knowledge level of parents of lactose intolerant children.

MATERIAL AND METHODS

The present study was undertaken to explore lactose intolerance awareness among the parents of lactose intolerant subjects. The methodology used for the study included the selection of 60 pediatric lactose intolerant patients in the age group of 1-5 years from the different hospitals of Punjab. To accomplish the objectives of the study an interview schedule was developed. Questionnaire was developed to assess the Knowledge level of parents regarding the various aspects of lactose intolerance before and after the intervention. The data was collected by personally administering the questionnaire to the mothers/ caretakers of the lactose intolerant children. The information from the respondents was utilized for preparing an educational package. Based on the knowledge level of the parents prior to the interventions, a booklet entitled "Understanding lactose Intolerance" was developed which included information regarding the various aspects of lactose intolerance *viz*, lactose intolerance and its signs and symptoms, diagnosis, treatment, myths and facts about lactose intolerance, compliance with and effects of a lactose free diet, dietary tips and lactose free recipes. The Parents were also provided with a detailed list of various lactose free products locally available in the market. The subjects were provided with detailed knowledge about the

disease and the role of lactose free diet on their health and nutritional status. The importance of label reading and ingredients list was also thoroughly explained to them. Nutrition education was provided to the subjects and their parents through personal counselling, lecture-cum-discussion for a period of 3 months. The impact of nutrition intervention was studied by comparing the pre and post intervention knowledge scores of the parents. Chi square test was used in order to assess the gain in knowledge of the parents after the interventions.

RESULTS AND DISCUSSION

Knowledge level

Table 1 presents the impact of nutrition intervention on the knowledge level of the parents of lactose intolerant children regarding various aspects of the disease. As it can

Table 1: Impact of nutrition interventions on the gain in knowledge level of the parents about various aspects of lactose intolerance

Knowledge Aspects	Pre Intervention (%)	Post Intervention (%)	t- value
Knowledge about the disease	100.00	100.00	0
Awareness about the disease	100.00	100.00	0
Main symptoms of the disease	86.67	96.67	1.43^{NS}
Foods to be avoided	100.00	100.00	0
Importance of label reading	76.67	90.00	2.42*
Ingredients to look out for	70.00	93.34	3.24**
Treatment of lactose intolerance	80.00	100.00	2.97**
Better choice for lactose intolerant children	70.00	93.34	2.56**
Yogurt can be consumed without any hesitation	46.67	86.67	4.64**
Awareness about lactose free diet	86.67	100.00	1.27^{NS}
Duration for lactose free diet	46.67	90.00	4.95**
Occasional indulgence in lactose	40.00	33.33	0.68^{NS}
LI children are always underweight	70.00	93.34	2.97**
LI children have poor bone health	26.67	70.00	4.95**
LI can be outgrown	76.67	46.67	3.78**
Management of LI	26.67	80.00	5.63*8
Difficulty in concentration	20.00	63.34	4.95**
Is LI same as Milk allergy	90.00	30.00	5.28**
Indiscrimination towards a LI child	100.00	100.00	0

*Significant at 5% level

** Significant at 1% level

^{NS} Non significant

Observed from the data, all of the parents had some theoretical knowledge about the disease. They knew that lactose intolerance occurs due to reduced activity of lactase enzyme in the small intestine, but they lacked practical knowledge regarding the correct food choices. The parents also knew that it is not a contagious disease. The data revealed, most of the parents (86.67%) knew the main symptoms of the disease prior to the intervention, the number of correct answers increased (96.67%) after being imparted with the intervention. But this increase was found to be insignificant. All of the parents also knew that milk and milk based products were the major foods to be avoided. Regarding the importance of label reading, 76.67 per cent agreed to the fact that it is an important aspect while purchasing food for lactose intolerant children. After receiving the nutrition intervention, this percentage increased significantly to 90 per cent. However, only 70.00 per cent of them knew exactly what to look out for on food labels but after intervention this percentage significantly increased to 93.34 per cent. Patients diagnosed as lactose intolerant must be advised of "risk foods, inadequately labeled, including processed meats, bread, cake mixes, soft drinks[4].

When enquired about the sole treatment of lactose intolerant disease , eight percent of the parents suggested a low lactose diet. After receiving nutrition intervention this percentage significantly increased to 100 per cent, i.e., all of the parents became aware of the fact that avoidance of lactose rather than complete restriction of lactose in the diet and inclusion of rich sources of calcium in diet was the only management of lactose intolerance. An ideal strategy for maintaining lactose intolerance is to drink milk in small amounts with food regularly, and to gradually increase the amounts as tolerated up to one cup per serving[6]. 70 per cent of the parents made the right choice of food for lactose intolerant children. This percentage also increased significantly (93.34%) after nutrition intervention.

Regarding an occasional lactose intake, 40.00 per cent of the parents reported that they let their children consume lactose in the form of sauces, cakes, pastries, biscuits etc. on a few occasions. However this percentage was found to be decreased to 33.3 per cent after being imparted with nutrition intervention though it was insignificant. The reason behind occasional indulgence in lactose was that adhering to a complete lactose free diet was very challenging.

Before intervention, 46.67 percent of the parents said that a lactose free diet was to be adhered lifelong, while for others lactose free diet was to be consumed only as long as the symptoms remained. However, after imparting nutrition intervention a significant increase (90.00%) was observed in the percentage of parents who said that lactose free diet was to be adhered for lifetime as it is a food borne intolerance. Only 46.67 per cent of the parents knew that yogurt could be consumed without any complications but this percentage increased significantly to 86.67 per cent after nutrition intervention. Lactose mal digesters can consume at least one cup of milk without experiencing symptoms, and that tolerance can be improved by consuming milk with a meal, choosing yogurt or hard cheeses[13].

The parents were asked whether according to them lactose intolerance could be outgrown, or whether it is a lifelong disease. About 76.67 per cent of the parents informed that the disease could be outgrown. However this percentage significantly decreased to 46.67 per cent after imparting nutrition intervention. This showed that the parents understood that lactose intolerance is a lifelong disease, which may become asymptomatic because of a lactose restricted diet, but will always be there.

With respect to prevention against developing further complications in the disease, 26.67 per cent of the parents reported that they avoided lactose in the diet of children with LI. After nutrition intervention this percentage significantly increased to 80.00 per cent. Thus the parents realized that lactose free diet was the most suitable for lactose intolerant children as it was a food borne intolerance and symptoms would arise with the minor consumption of lactose in the diet. Twenty per cent of the parents agreed that a lactose intolerant child often have difficulty with memorizing and concentration. But after imparting them with nutrition intervention, this percentage significantly increased to 63.34 per cent. Also, 26.67 per cent of the parents knew that most of the lactose intolerant children have poor bone health but after imparting nutrition intervention a significant increase was seen in this percentage (70%).The parents were advised during nutrition intervention sessions that calcium rich food products free from lactose may be incorporated in the diet of LI children as lactose free diet(decreased intake of dairy products) would have an effect on the bone mineral density. Lactose intolerance may be partly to blame for decreased intake of calcium-rich dairy foods which may contribute to low calcium intake risk factor for reduced bone density and osteopororis[14,15]. Almost all of the parents (90%) however did not know the difference between lactose intolerance and milk allergy but this percentage significantly decreased to 30 per cent after imparting with nutrition intervention. It was emphasized in the intervention sessions that LI was a food borne intolerance against any food product having lactose which was not digested by LI children. LI was not just milk allergy but inability to

digest lactose, thus if processed foods were to be consumed reading of food labels was must. Regarding any indiscrimination towards a lactose intolerant child, all of the parents agreed on treating the lactose intolerant child like any other child.

Knowledge score

Table 2 depicts the distribution of parents of the lactose intolerant children according to their scores observed in the knowledge test. The questionnaire consists of 24 questions based on lactose intolerance and its signs and symptoms, diagnosis, treatment, myths and facts about lactose intolerance compliance with and effects of a lactose free diet, dietary tips and lactose free

Table 2: Distribution of Parents According to their Knowledge Scores

Knowledge Scores (out of 24)	Pre Intervention (%)	Post Intervention (%)
Low (8 and below)	33.34	10.00
Average (9-17)	40.00	50.00
High (18 and above)	26.67	40.00
Mean ± SD	12.56 ± 3.92	16.6 ± 4.28
Chi –square	7.2*	

*significant at 5% level

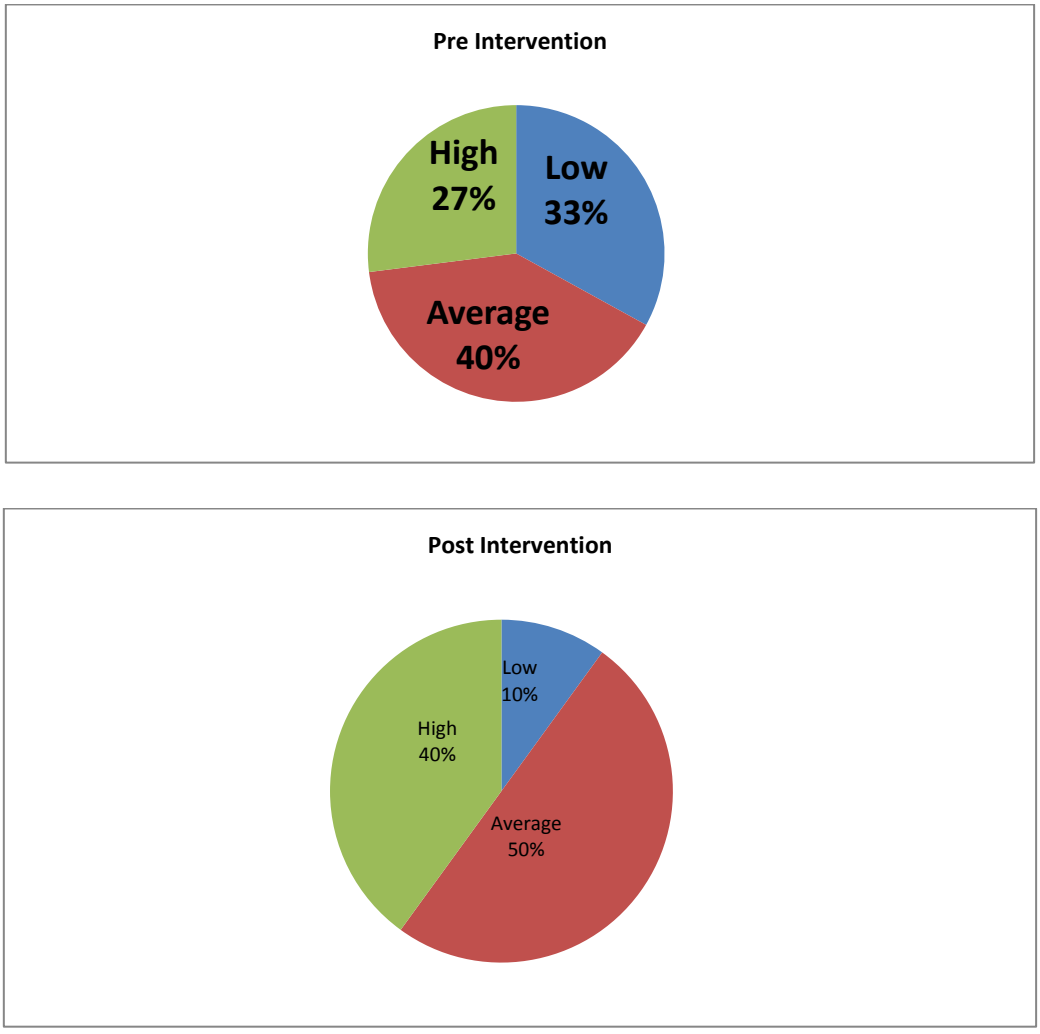

Fig. 1: Distribution of Parents According to their Knowledge Scores

recipes, lactose free products, importance of label reading and ingredients list and total scoring was done on the basis of 1mark for each correct answer and deduction of 1 mark for each wrong answer.

Before the nutrition intervention, the maximum percentage of parents (40.00%) had an average score between 9 to 17, followed by those who scored low, *i.e*., 8 and below (33.34%), and finally those who got a high score of 18 and above (26.67%). However, the percentage of parents scoring average increased significantly from 40.00 to 50.00 per cent and those scoring high scores increased from 26.67 to 40.00 per cent. A significant decrease from 33.34 to 10.00 per cent was observed in the percentage of parents scoring low. The average knowledge score obtained by parents significantly increased from 12.56 ± 3.92 to 16.6 ± 4.28.

Literature also investigated the mother's nutritional knowledge and attitudes and support the inclusion of knowledge and attitudes in dietary interventions[16]. In terms of the mothers' nutritional knowledge and attitudes, the knowledge score of the mothers varied from -13 to 10. Percentages of right answers for each of the items varied between 85.1% and 18.8%, including correct guesses, and between 65.6% and 7.1%, excluding correct guesses. A study supported the present results by reporting significant increments ($p<0.001$) in the post intervention mean scores of knowledge (2.17 vs.47), attitude (1.40 vs. 0.32) and practice (0.87 vs. -0.10) items for the intervention group compared to comparison group after receiving a nutrition education intervention for 6 weeks. The changes in knowledge ($F=17.72$, $p<0.001$), attitude ($F=6.41$, p and practice ($F=15.49$, $p<0.001$) in the intervention group were maintained even after adjusting for confounding factors[17].

CONCLUSION

Nutrition counselling showed a positive impact on the knowledge level of the parents regarding the lactose intolerance. An increase in knowledge score was observed after nutrition counselling with percentage of parents increased from 26.67% to 40% in a high category of knowledge score.

The present study recommended an extended follow up and counseling to the lactose intolerant children in order to achieve better and prolonged results.

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