

# Trends in Milk & Dairy products consumption in 4th year MBBS students and assessing their bone densities: a cross sectional study

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## ABSTRACT

**Background:** Milk and dairy products provide a package of essential nutrients despite the established benefits for bone health.

**Aim:** To find trends in medical students of a senior class about their consumption of milk and the dairy products and measuring their bone densities, with dexa-scan, to assess risk of osteoporosis.

**Methodology:** This cross sectional study was conducted online through Google classroom, in order to engage students and teachers for research activities and teaching methodologies at Lahore Medical & Dental College, Lahore, Pakistan for four months. After having detailed review of literature about the topic, we developed a simple structured questionnaire, which was uploaded to Google classroom assignment page and was kept ungraded form.

**Results:** The pilot research group of 27 students were trained first online and then through the Google classroom collected the data from rest of the students of the same class. Data entry and cleaning was done through Google classroom. Descriptive statistics including frequency and percentage were used to represent the data. Data was analyzed statistically through Google Classroom Analyzer.

**Conclusion:** Concluded from this study that the medical students who participated in this study were not taking the recommended daily amount of milk or dairy products.

**Recommendations:** To achieve the recommended daily milk and dairy products serving consumption, family involvement recommended that specifically address support for promoting daily milk and dairy products intake among adolescents.

**Keywords:** Milk, dietary habits, life style, medical students, online teaching, bone scan

## INTRODUCTION

Milk and its dairy products have many constructive health benefits and its consumption is important<sup>1-3</sup>. They help in strengthening the skeletal system<sup>2,3</sup>, improving body in all aspects<sup>4,5</sup> and play role in prevention of few diseases e.g. blood pressure and colon cancer<sup>6</sup> and colon cancer<sup>7</sup>. Even there are health benefits, the daily recommendations merely met by many<sup>8-14</sup> and snacks consumption with poor nutrients<sup>9,10,11,15</sup> are increasing among children's of all age groups<sup>15,16</sup>.

It has known that the pattern of milk and dairy products consumption may differ in different teenager's age groups<sup>12-14</sup>. Some factors have a major role in their eating behaviors<sup>12</sup>, important factors such as psychosocial and unhealthy behaviors<sup>12,14,16</sup> have not been recognized reliably<sup>17,18</sup>. In Pakistan there is limited data regarding the adolescents' consumption of healthy diet. It seems that investigations on milk and dairy products intake among Pakistani teenagers are not taken care-off. Therefore, the current study conducted to identify milk and dairy products consumption among students, specifically medical students of fourth year MBBS class in a private Medical school of Lahore, Pakistan, with an aim that they must have a better understanding of healthy food consumption. It expected that the findings from the study would provide essential information in developing interventions for adolescent dairy products eating behavior.

The objectives of the study are to find trends in Milk & Dairy products consumption in 4th year MBBS students, to assess the bone densities by scanning method and to employ Google classroom for study outcome as a tool.

## METHODOLOGY

This cross sectional study was conducted at Lahore Medical & Dental College, Lahore, Pakistan. Variables checked in the study for a period of 4 months. The variables of our study were Milk consumption and dairy items a questionnaire was uploaded at Google classroom, and question related to consumption of milk were asked. In addition, a dexa scan was done of the study

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participants to measure the bone density. Study population was 4th year MBBS students. Consecutive sampling method was employed, and consent was taken. Only 111, male and female students participated from a class of 162. *Out of these 111 students, only 79 students took the dexa-scan.*

**Data collection tool:** After having detailed review of literature about the topic, we developed a simple structured questionnaire, which was uploaded to Google classroom assignment page and was kept ungraded form. The pilot research group of 27 students were trained on Google Classroom and then through the Google classroom collected the data from rest of the students of the same class.

**Data Entry and Cleaning:** Through Google classroom

**Statistical package used:** Google classroom response analyzer

## RESULTS

Out of 162 class of 4th year MBBS, 111 participated (27 were from research Group – 3 and they were doing this research) in a survey based study on Google classroom. The responses of participants were analyzed in the Google classroom response analyzer, in form of percentages and shown in form of a pie charts. The variables of our study were Milk consumption and dairy items:

**Milk:** The 111 participants were asked regarding how often did they consume milk, with nothing added to it, of these 111, 19 (17.1%) said they did not consume milk at all during that month, therefore they did not proceed to the subsequent questions in this regard. The remaining participants responded to have milk either on daily basis or as less only a day in a month. A 32.4% said to take milk 4-7days a week, while the 67.5% said to drink it once in a while.

Of these 111 participants, 94 responded regarding the amount, or quantity of milk they consumed during a month time, more than fifty percent i.e. 51.1% said to drink 8 to 12 ounces of milk, while 31.9% drank less than a cup and 17% said to take more than 12 ounces. Regarding the type of milk, 93 respondents answered taking milk with less fat or fat free option, 46(49.5%) showed no preference to drinking lower fat or fat free milk, 21(22.6%) took lower fat milk round quarter of time and 8(8.6%) stated to only drink low fat or fat free option.

Fig. 1: Milk trends, serving daily, weekly, monthly

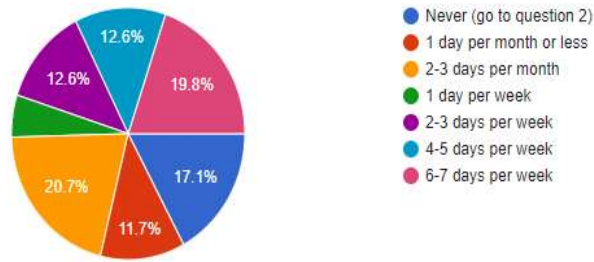


Fig.3. Milk preference: Low-fat to Fat free option

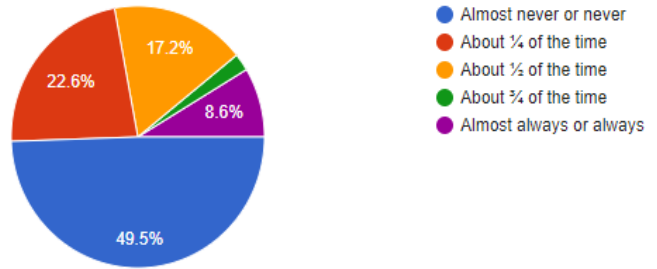
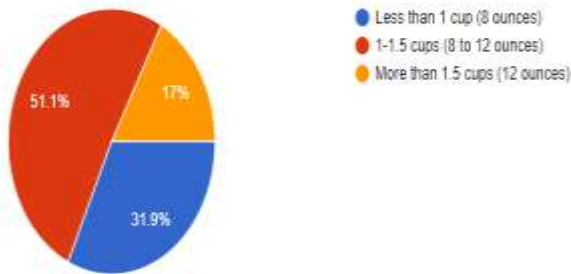


Fig. 2: Milk consumption per serving size



**Chocolate milk:** From 111 participants, 46(41.1%) did not drink chocolate milk hence they did not answer to the subsequent questions that followed. A 38.7% said to have it once or thrice in a month and less than 20% respondents said to drink chocolate milk once or daily throughout the week.

Question	6-7 days per week	Never	≤ 1 cup	1- >1.5 cups	1/2 - always times	1-3 days per month	1-5 day per week
How often do you drink milk	22(19.8%)	19 (17.1%)	-	-	-	-	-
How much beverage milk you usually drink	-	-	30(27%)	64(57.6%)	-	-	-
Milk low-fat or fat-free	-	46(41%)	-	-	47(42%)	-	-
How often do you drink chocolate milk	4(3.6%)	46(41%)	-	-	-	-	-
How much chocolate milk you usually drink daily	-	-	41(36.9%)	29(26%)	-	-	-
How often was the milk low-fat or fat-free	-	39(35.1%)	-	-	38(34%)	-	-
How often do you drink yogurt drink	2(1.8%)	44(39.6%)	-	-	-	37(33%)	27(24%)
How much yogurt milk you drink daily	-	-	45(40%)	22(19.8%)	-	-	-
How often was the yogurt drink low-fat or fat-free	-	40(36%)	-	-	34(30.6%)	-	-
How often do you consume milk with cereals	-	52(46.8%)	-	-	-	38(34%)	19(17%)
How much milk do you usually add to your cereal	-	-	33(29.7%)	37(33%)	-	-	-
How often was the milk added to your cereal, low-fat or fat-free	-	35(31.5%)	-	-	36(32.4%)	-	-
How often did you eat yogurt	7(6.3%)	-	-	-	-	41(36.9%)	41(36.9%)
Each time you ate yogurt, how much did you usually eat	-	-	85(76.5%)	9(8.1%)	-	-	-
How often was the yogurt you ate reduced-fat or fat-free	-	56(50.5%)	-	-	39(35%)	-	-
How often did you eat cottage cheese	1(0.9%)	81(73%)	-	-	-	25(22.5%)	3(2.7%)
Each time you ate cottage cheese, how much did you usually eat	-	-	33(29.7%)	37(33.3%)	-	-	-
How often was the cottage cheese you ate reduced-fat or fat-free	-	26(23.4%)	-	-	17(15.3%)	-	-
How often did you eat pudding or custard	1(0.9%)	43(38.7%)	-	-	-	57(51%)	10(9%)
Each time you ate pudding or custard, how much did you usually eat	-	-	34(30.6%)	39(35%)	-	-	-
How often was the pudding or custard you ate reduced-fat or fat-free	-	47(42.3%)	-	-	27(24%)	-	-
How often did you eat sour cream	-	88(79%)	-	-	-	18(16%)	5(4.5%)
Each time you ate sour cream, how much did you usually eat	-	-	26(23.4) Table spoon	9(8%) 1- ≥ 3 Table spoon	-	-	-
How often was the sour-cream you ate reduced-fat or fat-free	-	28(25%)	-	-	10(9%) 1/2 - 3/4 times	-	-
How often did you eat cheese (including low-fat; including on cheeseburgers or in sandwiches or subs)	1(0.9%)	25(22.5%)	-	-	-	50(45%)	34(31%)

From these 111 participants, the 70 respondent answered for consumption of chocolate milk 41 (58.6%) took it less than 8 ounces while 41.4% respondents took more than 8 to 12 ounces. 77 respondents - In choices of having it in fat free or low fat option, 39 (50.6%) said to consume it as is, while a very few respondents about 11.7% took a low fat or fat free option.

**Eating yogurt and yogurt drink [lassi]:** Eating and drinking yogurt (lassi) is mostly enjoyed in our part of the world. Our 110 participants answered regarding drinking yogurt drink, 44(40%) did not have yogurt milk, during that month, 33.7% had it a serving or

thrice in a month, while the remaining like having it almost every day. From these 110 respondents, 67 answered regarding the consumption of their serving size, 67.1% respondents took a serving size less than 8 ounces or 1 cup, while 32.9% took between 8 to 12 ounces. Of the 110 respondents, 74 answered having to take low fat or fat free options, 40(54.1%) had no preferences, 37.6% had low fat to fat free [skimmed] occasionally and 8.1% preferred fat free. 111 participants when asked about eating yogurt, a 43.2% responded having more serving during a week time, while 19.8% did not like taking yogurt. Of these

participants 94 responded regarding serving portion of taking yogurt, more than fifty percent i.e. 55.3% preferred less than half cup serving and a 44.7% liked having more than a cup serving.

More than fifty percent (58.9%) of the 95 respondents, when asked regarding the consuming low fat or fat free options in yogurt, liked having it as it is, while the 41.1% of these respondents preferred a low fat to fat free option in the yogurt.

**Cheese, Cottage cheese and Cream cheese:** 110 answered the question regarding consuming cheese, a 22.7% did not had cheese during that month, 45.5% students took serving up to 3 tablespoons and the remainder took almost daily. Of these, 91 responded to the question for preference to the low fat or fat free option, 65(71.4%) showed no preference to low fat or fat free cheese.

In question regarding having cottage cheese, 81(73.6%) did not eat cottage cheese, while only 1 (0.9%) said to have it daily. Of these 110, 39 responded to the amount of intake of cottage cheese, 33(84.6%) said to have it less than 8 ounces, and the remaining 15.4% had between 8 to 12 ounces. When asked regarding the preference to low fat or fat free option, 43 of the 110 respondent 26 (60.5%) said to have no preference to the low fat to fat free option and the 39.5% preferred the low fat to fat option in cottage cheese.

Cream cheese is another form of well-liked cheese, our respondents to this question were 98, of these 59(60.2%), however, did not had this during that month, and the rest had a 2 to 3 serving per week. A 50 of these 98 respondents answered the following on the amount of consumption of the cream cheese, 48% said to have it less than 1 tablespoon, 44% liked having it up to 3 tablespoons and the 8% enjoyed having more than 3 tablespoons. 51 responses were given for the preference to low fat to fat free option of cream cheese, 41 (80.4%) showed no preference to take a low fat or fat free option.

**Butter:** 110 participants responded to question regarding Butter, 44(40%) said not the take butter that month, 27.2% took at least 2 to 3 serving during that month and 32.7% took almost daily serving during a week. Of these 110, 86 participants responded to the amount of butter they consumed, 41(47.7%) said to take it less than 1 tablespoon, 34(39.5%) said to have it between 1 to 3 tablespoon and 11 (12.8%) had it more than 3 tablespoons. 87 participants answered for the preference to having low fat to fat free option in butter, 61(70.1%) said to have no preference to having low-fat or fat free, the 22.9% like having low fat to fat free option from about quarter to nearly three-quarter of times, and the 3.4% had exclusive like for low-fat and fat free option.

**Milk & Cereals:** One of the items taken for breakfast is cereals, our 109 participants answered the question regarding the use of milk in their cereals, 52(47.7%) did not take cereal for breakfast, 34.9% said to have 1 to 3 serving per month and less than twenty percent i.e. 17.4% had more than 3 servings per week. Of these 109, 70 respondents continued to the following question 47.1% said to take less than 8 ounces of milk with their cereals, while 52.9% loved having more milk with their cereals. The 71 responses for the option of taking milk in low fat to fat free form in cereals, 35(49.3%) liked having milk as it is and 50.6% had preference to the low fat to fat free option of milk.

**Custard & pudding:** 111 participants responded to eating custard ad pudding during the month, 38.7% said not to have any, 24(21.6%) said to had less than one serving in a month, 29.7% said to have 2 to 3 servings per month and less than ten percent had custard or pudding almost every day during a week. 73 responded to amount of servings they took of custards or puddings 46.6% said to have it less than 8 ounces and the 53.4% liked having more of it up to 12 ounces in a serving. 74 participants' response to having low-fat to fat free option, a 47(63.5%) said to have no preference, while a 36.6% chose to have low fat to fat free option in their custards and puddings.

**Sour cream:** 111 participants responded to question regarding having sour cream, 88(99.3%) did not eat sour cream during the month and about less than two percent said to have a variable

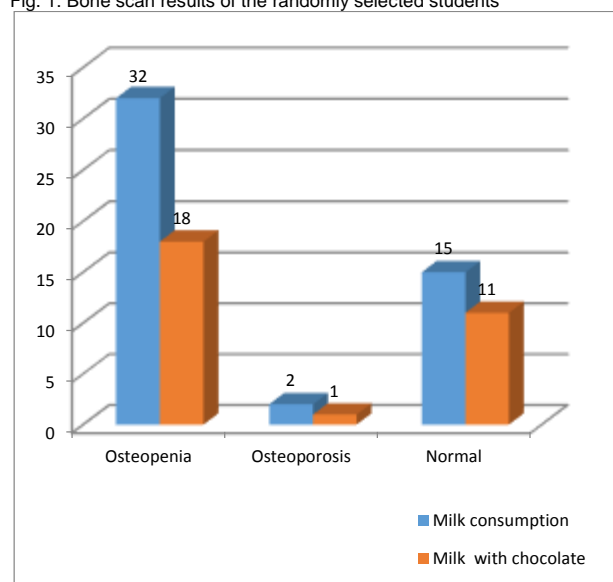
quantity of sour cream during the week. Of the 111 participants, 35 respondents answered regarding the serving size of the sour cream, 74.3% had less than 1 tablespoon, 20% took between 1 to 3 tablespoons and only 5.7% took more than 3 tablespoons. 38 of the 111 participants' response to have a low-fat to fat free option in sour cream, a 73.7% said to like it as it is and the remaining 26.4% preferred low-fat to fat free options.

**Whipped cream:** It is one of the most used item on desserts and drinks. Our participants gave 110 responses when asked on taking whipped cream, more than fifty percent i.e. 58.2% said not to take it during the month, 30% said to have it once to thrice in a month and 11.8% said to have a serving once or thrice in a week. Of these 110 respondents, 53 answered the following questions on their serving portions and the low fat to fat free options, a 25(47.2%) said to consume less amount that was less than 1 tablespoon, 24(45.3%) took about 1 to 3 tablespoons and 4(7.5%) said to have more than 3 tablespoons. A 60.4% had no preference in having whipped cream either in low fat or fat free form and remaining 39.6% preferred having low fat or fat free version of whipped cream.

**Coffee and tea:** Coffee and tea is one of the most frequented beverage amongst the medical students, 111 respondents answered the following question regarding their daily coffee and tea intake with milk, a 7.2% said not to drink either coffee or milk, a majority 78.4% said to have an almost daily consumption of these beverages up to 5 days a week and 14.4% said to have coffee or tea once in while during the month. Of these 111, 104 respondents answered regarding the amount of milk they added to their coffee or tea, along with the preference towards having low fat to fat free option, 57(54.8%) said to have about more than 3 tablespoons of milk in their beverage, a 35(33.7%) added up to 3 tablespoons and 12(11.5%) took less than 1 tablespoon in their coffee or tea. Regarding the preference towards low-fat to fat free option, a 64.4% preferred normal milk, 24.1% liked a quarter to half low fat serving and 11.5% opted for low-fat to fat free option almost all the time.

**Assessment of Bone densities:** Out of 111 study participants, only 79 (71%) agreed on the dexa-scan for assessment of bone densities. It was seen in more than half of students presenting with Osteopenia trend, 3.7% presented with osteoporotic sign and remaining were normal. The Z- score was taken to compare the values. A low Z-score (below -2.0) means the bone mass is less (and/or may be losing bone more rapidly) than expected for someone your age (WHO).

Fig. 1: Bone scan results of the randomly selected students



## DISCUSSION

The findings in our study have given us a clear idea that average daily milk and dairy products consumption among students of fourth year MBBS students participated in the study was less than the daily-recommended servings per day. Some investigators also reported similar findings<sup>19,20</sup>, some other reported different results<sup>12,19</sup>.

There is no significant association between low-level milk and dairy products intake, however studies reported that parental education, tasty milk<sup>14</sup>, home availability of milk, preference of milk taste, breakfast eating habits, higher socioeconomic status and social support were positive contributing factors to milk and dairy products intake<sup>12</sup>.

Family backing plays a significant contributing role in daily dairy products consumption. It has been seen in several studies that positive role of family as provider and role modeling<sup>12,20,21</sup>. This association shows that those students who perceived practical support from mothers can be those who will have more than 3 daily servings of milk and dairy products consumption<sup>22,23,24</sup>.

The results of bone scan done on 56 randomly selected students, from the same group are presented in chart 1. Students taking plain milk or milk with chocolate, still have lower bone density and probably osteopenia or osteoporosis. However according to researches done on this, it has been stated that too much consumption of soda (Fizzy drinks) may cause osteoporosis<sup>26</sup> and for students this can be a reality.

## CONCLUSION

The findings of the current study that examined only milk and dairy products intake among adolescents indicated that even fourth year MBBS students who are considered to be well aware of nutritional values did not meet the recommended daily milk and dairy products servings.

**Limitations of study:** Not all participants could be scanned for the measure of bone densities. Google classroom analyser was used for results. Hence, association and statistical test could not be employed. Data was not analyzed on another tool like SPSS. As there were few discrepancies in some of the variable results, a better format can be used for future works.

**Recommendations:** To attain the recommended daily milk and dairy products serving consumption, family involvements in any programs that specifically address emotional and practical support for promoting daily intake of milk and dairy products among adolescents are suggested. Due to limitation, it was not possible to have bone scan of all the students and question was not added if they are drinking soda or not, so another research can be done to further strengthen the hypothesis of the study.

**Conflict of interest:** Authors have no conflict of interest.

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