Effect of Probiotic Yogurt Compared to Traditional Yogurt on Management of Antibiotic Associated Diarrhea among Children

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Abstract

Background: The most often recommended medications for kids are antibiotics, although sadly many of them have the potential to cause diarrhoea that is connected with antibiotic use. An AAD is a most pediatric problem in both inpatient as well as outpatient settings. Probiotics are substances found in some meals and supplements that may help cure AAD. Because of this, **the aim of present research is to:** evaluate the effect of probiotic yogurt to traditional yogurt on the treatment of AAD in young patients receiving antibiotics. **Design:** A quasi experimental research design. **Setting:** The research was carried out at Minia University Hospital for Obstetrics and Paediatrics (MUHOP) and Misr El-Hora General Hospital which are associated with the Ministry of Health and Population in the paediatric medical ward and PICU. **Sample**: A purposeful sample of 150 children was randomly assigned to one of three groups (probiotic yogurt, traditional yogurt, and control). Two tools were used: a structured interview questionnaire and an AAD record. **Results**: The current research found that more than fifty percent of the study and control groups were males, with a mean age of two years. Furthermore, the probiotic yogurt group had the lowest mean frequency and duration of AAD, as well as the lowest percentage of AAD degree, preceded by the traditional yogurt group, and lastly the control group. **Conclusion**: Probiotic yogurt was useful in the treatment of AAD. **Recommendations:** Parents and nurses were educated about the necessity and effectiveness of probiotic yogurt and food in the management of AAD.

Keywords: antibiotic, children, diarrhoea, probiotics, yogurt.

Introduction

The most antibiotics are commonly given medications in the paediatric personnel, with more than half of all participants between the ages of birth and eighteen years are receiving them **(Thänert et al., 2022).** Antibiotic medication, on the other hand, should be used with caution because it can cause a variety of side effects, including antibiotic-associated diarrhoea (AAD) **(Hales et al., 2018).**

Antibiotic-associated diarrhoea (AAD) is a frequent issue observed in both outpatient and hospital settings, affecting up to one-third of all antibiotic-treated patients **(Kesavelu and Jog, 2023),** and more specifically 11–62% of children and up to 80% of hospitalized toddlers **(Tanr Basaranolu et al., 2023).**

The AAD is described as diarrhoea that occurs within a few hours post the start of antibiotic medication and 8 weeks after the termination of antibiotic therapy **(Baunwall et al., 2021).** Antibiotics' direct harmful effects on the intestine include impaired digestive function as a result of lower gut bacteria concentrations or pathogenic microorganism overgrowth **(Kim et al., 2017).** Some antibiotics lower the bacterial variety of the intestinal lumen, and these changes in the number and makeup of the gut microbiota contribute to the microbiome's dysfunction **(Shao et al., 2020).**

Probiotics are characterized as a helpful live microbial feed supplement. They regenerate typical commensal microbes in the gut, which are useful for personnel beings because they assist treat severe infectious diarrhoea, colonic issues, constipation, pelvic radiotherapy side effects, food allergies, involving hypersensitivity of milk, and play a role in the controlling of carcinoma in the colonic. Because of their multiple ways of action, beneficial bacteria are readily obtainable, simple to give, relatively affordable, and less prone to produce opposition **(Rehman et al., 2022).**

Probiotics can be found in meals, fluids, tablets, as well as capsules milk, like yoghurt, a few drinks, as well as soy products. Lactic acid bacteria are popular probiotics. Probiotics are used in AAD as they seek out nutrient availability and binding locations, increase the acidity of the content's gut, create stimulate both particular and non-specific immune responses using a number of substances **(Cichoskaand Ziarno, 2022).**

The nurse practitioner is particularly suited to assess the patient's controlled needs and outcomes of health promotion. A health team and patient acceptance on ways to avoid negative effects related to antimicrobial utilization, involving the role, must be included in the avoidance and treatment of the health-promoting plan of action in the setting of AAD. Nurse practitioners should be informed of access AAD preventive and treatment approaches to guarantee the greatest results. Because of rising interest in alternative medicines and healthcare worries about the urgent of drug- opposition diseases. Nurse staff must be ready to explain the potential advantages and applications of probiotics in avoiding AAD (**Lemiech-Mirowska et al., 2023).**

Significance of the Study

AAD develops in up to 30% of children who get antibiotics in an outpatient setting. AAD usually occurs quickly after starting antibiotic medication. AAD affects approximately 11% of children. The two risk factors found for AAD are the type of antibiotics used and children under the age of two **(Schneider and Sant'Anna, 2022).** AAD is a potentially risky antibiotic side effect of treatment. AAD is still a health interest that can result in issues including dehydration, severe pain, inability to finish the prescribed antibiotic course, increased healthcare expenses, toxic megacolon, and an increased risk of death in children **(Ma et al., 2019).** Besides that, the researcher discovered that numerous studies have demonstrated the benefit of a probiotic diet in managing AAD in adults.

Despite the fact that such studies are lacking in paediatrics and the fact that the research that observed in the practice setting that many children on antibiotic drug affected with AAD as well as its associated issues, the present research sought to compare the effect of probiotic yogurt versus traditional yogurt on managing AAD among how probiotics work children with the aim of enhancing the child's health by boosting The child's susceptibility to antibiotics, completing the antibiotic course, and avoiding dryness.

The Aim

The current research sought to examine the effect of probiotic yogurt compared to traditional yogurt on the managing AAD among children.

Research Hypotheses

Children who receive probiotic yogurt and traditional yogurt (study groups) have less frequency of AAD than those who don't receive any type of yogurt in control group.

Children who receive probiotic yogurt and traditional yogurt (study groups) have less degree severity of AAD than those who don't receive any type of yogurt in control group.

Children who receive probiotic yogurt and traditional yogurt (study groups) have less duration of AAD than those who don't receive any type of yogurt in control group.

Operational Definition

Antibiotic Associated Diarrhea (AAD) is diarrhea assoiated with antibiotic therapy and is defined as at least three watery or loose stools /day for a minimum of 2 consecutive days **(Kwon et al., 2022).**

Probiotic: According to Food and Agriculture Organization (FAO) and World Health Organization (WHO), probiotics are defined as "live microorganisms which when administered in adequate amounts confer a health benefit on the host". The probiotic products provide various clinically proven health benefits like modulation of host's immune system, anti-carcinogenic and anti-mutagenic activity, alleviation of lactose intolerance ….. etc **(Patel et. al., 2019)**.

Participants and method

Research design

The research design was quasi-experimental utilized in the ongoing study.

Setting

The research was carried out at Minia University Hospital for Obstetrics and Paediatrics (MUHOP) and Misr El-Hora

General Hospital which are associated with the Ministry of Health and Population.

Participants

A purposive sample of 150 children admitted to prior-mentioned settings who satisfied the case with criteria during an 8-month (a total of 150 children) was used. The participants were put into three equal groups: probiotic yogurt (50 children), traditional yogurt (50 children), and control (50 children) by using a random number table. Inclusion criteria: children of either gender, aged 1 to 6 years, presenting in the previously mentioned setting with AAD, respiratory disorders, and those on the same treatment regimen. Children with diarrhoea caused by factors other than antibiotics, such as gastrointestinal problems, and children with probiotic sensitivity are excluded. The sample size was calculated by a statistical method referred to as sample's power analysis as well as admission rate of children in the hospitals that selected. According to the up coming formula: $n= (z2\times p \times q)/D2$ at CI 95% and power 80%., the sample size was 150 children.

Data collection tools for the research

These tools were used to acquire the necessary data:

The researchers created the structured interview questionnaire after reading the pertinent literature; it involved two parts:

Part I: Personal data about the kid, such as age, gender, and place of residence

Part II: Clinical data, it comprises medical diagnosis, antibiotic kind, antibiotic duration, and AAD duration.

Tool 2: An organized AAD record: This was utilized to record the repetitive frequency of AAD/day, the degree of AAD, and the duration of AAD. These tools were developed by the researcher based on the **Hussein (2015),** and it contains nine multiple-choice questions which classified into four questions related to frequency, four questions concerning to degree, and lastly one question related to duration of AAD.

Tool's Validity as well as Reliability

Five paediatric medical and paediatric nursing specialists assessed the content's validity. Cronbach's alpha between questions was.870, indicating tool dependability. The alpha number is clearly very high, as well as the tool is trustworthy.

Pilot study:

It was conducted on ten percent of the children (15 children) to assess the transparency and usability of the tools as well as to evaluate the time necessary for data collection. The tools were not changed based on the outcomes of the pilot research, and the children in the pilot were included in the overall sample.

Ethical considerations

The Research Ethics Committee at Minia University's Faculty of Nursing provided written clearance. The researcher also obtained formal permission from the directors of the aforementioned hospitals, as well as the directors of the medical and paediatric intensive care units. The children's carers who participated in this study provided written formal consent. The researcher described the objective and nature of the study through direct personal interviews, ensuring that the data was confidential and would only be used for research purposes. The study followed conventional ethical guidelines for participants in the research; identity and privacy were maintained through data coding, and the parent has the privilege to decline his child's involvement in the research without explanation.

Field work

Preparatory phase

The research was carried out with the approval of the directors of Minia University Hospital for Obstetrics and Paediatrics (MUHOP) and Misr El-Hora General Hospital. Following that, the researcher began collecting the necessary data from study groups. After satisfying inclusion criteria and outlining the goal, tools, benefits, and duration of the study, the researcher obtained oral and written consents from caretakers of children included in the study groups.

Data was collected from August through March 2023. Data was collected during the hospital's usual work day.

The researcher next began gathering personal information about every child from his or her medical file; obtaining the needed personal data for each child took roughly 10–15 minutes.

Following the collection of personal data, the researcher began collecting medical information from the kid's medical records and the child's carer; this took around 15–20 minutes for each child. The researcher then begins working with intervention groups.

Implementation phase

In Probiotic yogurt group; The researcher gives the child who suffers from AAD, at least for two successive days, a cup of probiotic yoghurt twice daily (first cup in the morning and second cup in the evening), after 2.30 to 3 hours of taking antibiotics for four successive days, and then the researcher monitors the repetitiveness of AAD per day for four consecutive days for assessing repetitiveness, severity degree, and duration of AAD. That was documented in each child's AAD record.

Note: in the morning, the researcher provides the kid with a cup of probiotic yogurt by himself, while in the evening, the researcher advises and asks the carer to give the child a cup of probiotic yogurt by phone call and make sure that the child eats the cup of probiotic yogurt.

In traditional yogurt group; the researcher gives the child who suffers from AAD for at least 2 successive days a cup of traditional yogurt twice daily (fist cup in mooning and second cup in evening), after 2.30 to 3 hours of taking antibiotic for four successive days, after that the researcher monitors repetitiveness of AAD/day for four successive days for assessing repetitiveness, severity degree, and duration of AAD. That was documented in each child's AAD record.

In the control group, which received no intervention (no yogurt) other than routine hospital management and care (drink fluids that contain water, sugar and salt such as oral rehydration solution, and fruit juices), the researcher monitored the repetitiveness of AAD per day for four successive days to assess the repetitive regularity, severity degree, and period of AAD. That was documented in every child's AAD records

Note: All forms of yogurt include probiotics, but in small amounts, whereas probiotic yogurt is distinguished by a high percentage of natural probiotics that are beneficial for digestive issues. The causes of the waiting time following antibiotic administration are that medications destroy both dangerous and healthy bacteria at the same time; thus, we wait two to three hours after providing the antibiotic so that the body can benefit from the beneficial bacteria found in yogurt.

Statistical Design

The SPSS statistical program version 20 was used to analyze the data. The numerical data were reported as the mean standard deviation. The frequency and proportion of qualitative data used A comparison of qualitative variables using the parametric Chi square test The non-parametric t-test was used to compare quantitative variables; The Anova repeated measures test was put to use for contrasting study and control groups, and this was documented in each child's AAD record for successive days; Pearson (r) correlation was utilized to evaluate variable's correlation; a P-value of 0.05 was statistically noteworthy ; and a P-value of 0.001 was statistically extremely important.

Results

Table (1) illustrated children's personal data, it came out that the average age of the children tested in both studies (probiotic yogurt and traditional yogurt), and control groups was (2. 37 ±2.62, 2.60 ± 2.81, and 2.28±2.72) respectively. Concerning sex and residence of children, more than half of them were male (60%, 50%, and 56%) respectively, and near to half (46%, 42%, and 50%) of them from urban. In terms of personal data, there was no statistically noteworthy distinction between the study and control groups.

Table (2) showed children's medical data, the highest percentage of children (50%, 40%, and 44%) respectively in the study and control groups was diagnosed with pneumonia,

whereas highest percentage (42% and 40%) in traditional yogurt group and control group was diagnosed with bronchiolitis. Also, concerning to type of antibiotic the highest percentage of children (34%, 26%, and 28%) respectively in the study and control groups were taking amoxicillin antibiotic.

Table (3) Indicates that mean duration of taking antibiotic were (3.69±1.219, 3.28 ±1.471, and 3.02±1.81) respectively in the study and control groups. Also, the average duration of AAD manifestation after commencing antibiotics was (2.55 ±0.585, 2.04 ± 0.844, and 2.40 ± .606) respectively in the study and control groups. Moreover, there was statistically noteworthy distinction between the study group and control group in terms of antibiotic duration or the length of AAD manifestation after commencing antibiotics.

Table (4) demonstrates that there was no statistically noteworthy distinction between the study group regarding AAD frequency distribution in first day and control group (6.64 ±1.881, 6.67±1.421, and 6.55±1.48, respectively). On the other hand, after taking probiotic and traditional yogurt in second, third, and fourth days there was a significant statistical distinction at P< 0.0001. The lowest distribution of frequency of AAD were in probiotic yogurt group, followed by traditional yogurt group, and finally control group who received routine care only. This table appears to have proven the study's initial hypothesis.

Table (5) demonstrated percentage distribution of degree of AAD during first 4 days of intervention among the study and control groups, about two third of children in first day of intervention had moderate diarrhea (58%, 56%, and 60%, respectively) in three groups. According to the same table, on the second day, majority of the study groups (82% and 76%) had moderate degree of AAD and minority (6% and10%) of study group suffered no AAD. whereas in control group the majority (70%) had moderate AAD. While in third day probiotic yogurt group (40%) had no diarrhea, and (60%) had mild AAD followed by traditional yogurt group (16%) had no diarrhea, and (74%) had mild diarrhea, and lastly the control group (52%) had moderate diarrhea. Furthermore, most children (88%, followed by 70%) had no diarrhea after taking of probiotic yogurt and traditional yogurt. In contrast, 74% of those in the control group who just received routine treatment had moderate AAD. Also, there were statistically significance difference between study groups and control regarding to degree of AAD in second, third, and fourth day. This table appears to have proven the study's second hypothesis.

Table (6) cleared that the lowest average of duration of AAD after starting taking was in probiotic yoghurt group 2.92±.643, followed by traditional yoghurt was 3.052±.562, and lastly in control group 3.99±.654. Also, there was a statistically significant difference in the average duration of AAD between the study group and control groups. It is observed that, this table proved the third hypothesis of the study.

Table 1: Percentage Distribution of Personal Data of Children in Study and Control Groups

Items	Probiotic yogurt group(50 children)		Traditional yogurt group (50 children)		Control group (50 children)		X2	p-value
	No	%	No	%	No	%		
Age								
1>3	31	62	35	70	30	60	0.249	0.883 NS
3≥6	19	38	15	30	20	40		
Mean±SD	2. 37 ±2.62		2.60 ± 2.81		2.28±2.72			
Sex								
Male	30	60	25	50	28	56	6.72	0.917 NS
Female	20	40	25	50	22	44		
Residence								
Urban	23	46	21	42	25	50	0.897	0.298 NS
Rural	27	54	29	58	25	50		

Table 2: Percentage Distribution of Clinical Data of Children in Study and Control Groups

Items	Probiotic yogurt group (50 children)		Traditional yogurt group (50 children)		Control group (50 children)	
	No	%	No	%	No	%
Diagnosis						
Pneumonia	25	50	20	40	22	44
Bronchiolitis	13	26	21	42	20	40
Bronchitis	7	14	5	10	3	6
Others	5	10	4	8	5	10
Types of Antibiotic						
Amoxicillin	17	34	13	26	14	28
Unasyn	7	14	6	12	6	12
Flumox	6	12	13	26	11	22
Fortum	4	8	5	10	6	12
Cefobid	4	8	4	8	4	8
Erythromycin	2	4	3	6	2	4
Claforan	3	6	1	2	1	2
Unasyn, Erythromycin	5	10	2	4	3	6
Erythromycin, Amoxicillin	2	4	3	6	3	6

Table 3: Differences in the mean duration of antibiotic use and the mean duration of AAD appearance in children between the study and control groups

Items	Probiotic yogurt group(50 children)	Traditional yogurt group (50 children)	Control group (50 children)	F	P-Value
	Mean±SD	Mean±SD	Mean±SD		
Duration of taking antibiotic	3.69±1.219	3.28 ±1.471	3.02±1.81	4.45	0.108NS
Duration of appearance of diarrhea	2.55 ±0.585	2.04± 0.844	2.40± .606	0.854	0.298NS

Table 4: Comparison between Mean of Frequency of AAD during First 4 Days of Intervention

Items	Probiotic yogurt group(50 children)	Traditional yogurt group (50 children)	Control group (50 children)	F	P-Value
	Mean±SD	Mean±SD	Mean±SD		
AAD's mean of frequency in first day	6.64 ±1.881	6.67±1.421	6.55±1.48	3.483	0.175NS
AAD's mean of frequency in second day	5.14±1.091	6.09±1.143	6.65±1.436	11.699	0.003*
AAD's mean of frequency in third day	4.01±0.582	5.89±1.056	6.39±1.098	14.450	0.0001**
AAD's mean of frequency in fourth day	2.89±0.753	3.65±0.921	4.97±0.789	20.933	0.0001**
Grand Mean of AAD Frequency	4.67±1.078	5.575±1.085	6.14±1.088	52.575	0.0001**

Table 5: Percentage Distribution of Degree of AAD during First 4 Days of Intervention

Items	Probiotic yogurt group(50 children)		Traditional yogurt group (50 children)		Control group (50 children)		F	P-Value
	No	%	No	%	No	%		
The AAD degree on the first day of study								
No diarrhea	0	0	0	0	0	0	0.526	0.713 NS
Mild diarrhea	21	42	22	44	20	40		
Moderate diarrhea	29	58	28	56	30	60		
The AAD degree on the second day of study								
No diarrhea	3	6	2	4	0	0	10.977	0.005*
Mild diarrhea	41	82	38	76	15	30		
Moderate diarrhea	6	12	10	20	35	70		
The AAD degree on the third day of study								
No diarrhea	20	40	8	16	0	0	37.343	0.0001**
Mild diarrhea	30	60	37	74	24	48		
Moderate diarrhea	0	0	5	10	26	52		
The AAD degree on the fourth day of study								
No diarrhea	44	88	35	70	11	22	45.746	0.0001**
Mild diarrhea	6	12	14	28	37	74		
Moderate diarrhea	0	0	1	2	2	4		

Table 6: Comparing the mean of AAD duration across the study and control groups

Items	Probiotic yogurt group (50 children)	Traditional yogurt group (50 children)	Control group (50 children)	F	P-Value
	Mean±SD	Mean±SD	Mean±SD		
Mean of Duration of AAD	2.92±.643	3.052±.562	3.99±.654	11.835	0.003*

Discussion

Probiotics are living microorganisms that, as medications or dietary supplements, serve to maintain a healthy microbial balance in a human's or other host's digestive system. Because of their qualities, probiotics may assist in enhancing homeostasis and hence prevent adverse effects associated with antibiotic therapy. Antibiotics are often used to treat infections in children such as otitis media, streptococcal pharyngitis, and pneumonia. Antibiotics are used three times more frequently by children than by adults. While these antibiotics may heal diseases, they can also cause unpleasant side effects such as diarrhoea. The standard therapy for AAD is to stop taking antibiotics, which might result in incomplete courses and difficulty addressing the underlying illness, perhaps leading to a prolonged duration of stay in the hospital and increased costs (**Bisht and Garg, 2023).**

The current research found that more than fifty percent of the study and control groups were boys, with average age of two years old. In terms of where they lived, over half of them were from cities. Furthermore, there was no statistically significant variation in personal data between the two groups.

The research's results are coherent with those of Bilal Ali **Anjum et al. (2022),** who did a study on the "Comparison of Efficacy of Yoghurt versus Probiotics for the Management of Acute Diarrhoea" and discovered that over one half of their study group was male. Furthermore, our results are coherent with those of **Abbasi et al. (2021),** who conducted a quasi-experimental study to comparing effectiveness of yoghurt versus probiotics for the treatment of acute diarrhoea in children with acute gastroenteritis and mention that the average age of their study sample was two years. Another investigation on the impact of

probiotics on pharmacological side effects was conducted by **Ren et al. (2022).** Another study by **Ren et al. (2022)** on the effect of probiotics on pharmacological side effects found that nearly half of the study group came from urban areas.

In terms of the children studied, almost fifty percent of the study and control groups were diagnosed with pneumonia, followed by forty percent in the group ingesting traditional yoghurt and forty percent in the control group being diagnosed with bronchiolitis. Furthermore, in terms of antibiotic type, the majority of children in both the research and control groups received amoxicillin.

The current study's findings are consistent with **Hussein (2015)** finding that the majority of his study sample had pneumonia. In addition, the same study disputed our findings about the type of antibiotic used; in his study, the majority of his sample received Rocfine antibiotic.

The current investigation found that the average duration of antibiotic use in the study and control groups was three days. In addition, in both the research and control groups, the average duration of AAD manifestation after commencing antibiotics was two days. Furthermore, there was no statistically significant difference between the study and control groups in terms of antibiotic duration and the duration of AAD presence after commencing antibiotic.

This finding is coherent with **Mekonnen et al. (2020),** who found that AAD develops swiftly after antibiotic medication. Another study, titled "A practical guide for probiotics applied to the case of antibiotic-associated diarrhoea in the Netherlands," was conducted by **Agamennone et al. (2018)**, who reported that the gastrointestinal disturbance symptoms occurred early after the initiation of antibiotic treatment.

According to the current study, the probiotic yoghurt group had the lowest mean frequency of AAD among children (four days), followed by the traditional yoghurt group (five days), and lastly the control group (six days) who got only routine treatment. It is supported by **Rehman et al. (2022),** who carried out a quasi-experimental study comparing the effectiveness of probiotics (Bacillus Clausii) versus yoghurt in the treatment of children with severe watery diarrhoea in terms of frequency variation and consistency of stools and discovered that probiotics were superior in words of frequency as they reduced the frequency of AAD when compared to traditional yoghurt.. **Dhongade et al., (2022)**The results of the present research demonstrated that eating probiotic foods, particularly yoghurt, boosted recovery and shortened the duration of severe infectious diarrhoea and antibiotic-associated diarrhoea in children, with no known negative consequences.

In terms of AAD severity, the ongoing research found that almost two-thirds of children in three groups had moderate diarrhoea on the first day of intervention, whereas the majority of study groups had mild AAD on the second day. The majority of those in the control group, in contrast, had mild AAD. Furthermore, nearly half of the probiotic yoghurt group had no diarrhoea on the third day of intervention, while the majority of the traditional yoghurt group had mild diarrhoea and over one half the control group suffered from moderate diarrhoea. Furthermore, after ingesting probiotic yoghurt and traditional yoghurt on the fourth day, the majority of children in the study groups had no diarrhoea, whereas the majority of children in the control group experienced moderate diarrhoea. Also, there were statistically significance difference between study groups and control regarding to degree of AAD in second, third, and fourth day.

The current study's findings are consistent with **Hussein** (2015) findings that there were statistically noteworthy distinctions between the two groups from the second to fourth days of diarrhoea. This finding is also coherent with **Mantegazza et al., (2018),** in this study; they reviewed the most recent data on the use of probiotics in both the avoidance and cure of AAD, particularly Clostridium Difficile, in children. There is also fresh information on LGG survival under treatment with amoxicillin/clavulanate.

In terms of the mean length of AAD, the current study found that the probiotic yoghurt

group had the shortest mean duration of AAD after commencing treatment, next by the traditional yoghurt group, and the end control group. In addition, there was a statistically noteworthy distinction in the average duration of AAD between the two groups.

The current study's findings are consistent with those of **Rehman et al. (2022),** who found a statistically significant correlation in terms of consistency and frequency in the probiotic and yoghurt groups; however, probiotics were superior to yoghurt in terms of frequency.

Conclusion

Present research summed up that probiotic yoghurt is effective in the management of AAD in children in terms of decreasing the frequency, severity, and duration of AAD among children in the probiotic yoghurt group compared to the traditional yoghurt group and finally the control group.

Recommendations

Educating parents and nurses about the significance and efficiency of probiotic yoghurt and food in managing AAD. Also, for further studies; replication of such study on children before developing of AAD to assess effectiveness of probiotic yogurt on prevention of AAD.

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Conflicts of interest

There are no conflicts of interest.

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