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Adjustment Oral Fluids Intake on Decreasing Edema Among Children with Nephrotic Syndrome

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Abstract: Nephrotic syndrome (NS) is a common renal problem in pediatrics. Edema in NS causes hospitalization of the child and is followed by disruption to schooling and separation from siblings. The aim of the current study was to determine impact of adjustment of oral fluids intake on decreasing edema among school age children with NS. A quasi experimental design was utilized. The current study hypothesized that school age children with NS who will adjust oral fluids intake according to urine output in study group will have body weight less than those in control group and there will be positive relationship between oral fluids intake, urine output and body weight among school age children in both groups. The study was conducted in medicine wards in New Educational Specialized Pediatric Hospital and El-Moneera Educational Pediatric Hospital, Cairo University. A purposive sample of 50 school age children with NS was (divided equally into 25 in study group and 25 in control group). Following tools utilized which were a structured interview questionnaire schedule, child's knowledge about NS assessment tool, child's knowledge about care of NS during hospitalization tool and monitoring body weight, fluid intake and urine output record. There were statistically significant differences between study and control groups regarding body weight, oral fluids intake and urine output. The current study recommended that replication of such study on different age groups and different settings to generalize results of current study.

Key words: Nephrotic Syndrome · School Age Children · Edema · Fluid Intake · Body Weight

INTRODUCTION

Nephrotic syndrome (NS) is a group of signs and symptoms including low blood protein, proteinuria and generalized edema [1]. NS is a primarily pediatric disorder and is 15 times more common in children than adults. NS affects 16 in 100,000 children worldwide/year, making this condition one of the common childhood kidney diseases and the ratio of males to females is approximately 2:1 during childhood [2, 3]. NS is associated with a high relapse rate [4]. The commonest type of NS in children is called idiopathic nephrotic syndrome (INS) which represents 90% of cases before 10 years and 10% after 10 years of age [5].

NS is caused by idiopathic renal diseases or by a variety of secondary causes [6]. Most of the children (90 %) with NS have a form of the INS. The remaining 10% of children with NS have secondary causes related to systemic or glomerular diseases [2]. Secondary causes of NS such as infection e.g. sore throat, use of certain drugs, immune disorders, NS can accompany kidney disorders such as glomerulonephritis [7].

The most common symptoms of INS include edema which initially noted around the eyes and in the lower extremities, with the time the edema becomes generalized, with the development of ascites, pleural effusion, genital edema, weight gain, oliguria, anorexia, irritability, abdominal pain and diarrhea are common whereas hypertension and gross hematuria are uncommon [5].

The course of treatment for NS includes specific treatment and nonspecific treatment. Specific treatment focuses on the underlying causes of the condition, while nonspecific treatment includes corticosteroid, immunosuppressive, antihypertensive, diuretic medications and antibiotics for infections. Supportive treatment may also include diet, high in protein and fiber, but low in saturated fat and salts [8]. Children with mild to moderate edema may be managed as outpatients. Affected

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children may attend school and participate in physical activities as tolerated. But children with severe symptomatic edema including large pleural effusion, ascites, or severe genital edema should be hospitalized [2].

Nursing management of NS children involves assessment and intervention. Nurses should assess child's condition but the first priority is to assess the child's fluid status as the hypoalbuminemia predisposes the child to the risk of developing hypovolaemia [9]. Whereas nursing intervention involves administering medications which are diuretics, antibiotics and corticosteroids as prescribed, asking dietitian to plan a low sodium diet with moderate amount of protein, restricting fluid intake, providing meticulous skin care to combat edema, encouraging activity and exercise, monitoring and document the location and character of edema, monitoring intake and output hourly and stressing the importance of adhering to the special diet [10].

As edema is a presenting symptom in about 95% of children with NS. Edema can progress rapidly or slowly. Ultimately, it becomes generalized and can be massive. Edema can cause GIT distress, respiratory distress and hypertension [11]. Certain complications can arise such as infection which is the major complication of NS [12]. Edema in NS causes hospitalization of child and followed by disruption to schooling and separation from siblings during hospital admission which can impact on child and family and causes psychological as well as physical sequalae, in addition, causes altered body image and decrease in the child's self-esteem which being difficult for both child and parents [9]. So based upon these problems which face school age children with edema, the current study aimed to assess the impact of adjustment oral fluids intake on decreasing edema of school age children with NS.

MATERIALS AND METHODS

Research Design: A quasi experimental design was utilized to carry out the current study.

Research Hypotheses:

- School age children who will adjust oral fluids intake according to their urine output in study group will have body weight less than those in control group.
- There will be positive relationship between oral fluids intake, urine output and body weight among school age children in study and control groups.

Setting: The current study was conducted in medicine wards in New Educational Specialized Pediatric Hospital, (NESPHCU), Cairo University and El-Moneera Educational Pediatric Hospital. These 2 pediatric hospitals provide free treatment and care for all diseases and children from all Egypt.

Sample: A purposive sample was used to conduct the current study. A total of 50 school age children with NS were included in the study according to the inclusion criteria. Those school age children (50) were divided equally and randomly into 2 constructed groups (25 school age children in study group and 25 school age children in control group). Determination of sample size was calculated according to statistical procedure known as power analysis of the sample: According to phenomenon of NS and power analysis the size of the sample which resulted was 50 school age children.

Inclusion Criteria:

- Age between 6-12 years
- Fully conscious and had no cognitive impairment.
- First time to be diagnosed with NS.
- Had no other medical diagnoses than NS.
- All children under the same protocol of therapy of NS (e.g. presinsone, Lasix).

Tools for Data Collection: There were four tools used, three tools of them were constructed by the research investigators after reviewing the related literature, those tools were as following:

- A Structured interview questionnaire schedule, it included 7 questions related to child's, age, sex, residence, level of education and medical history of the child as frequency of previous admission of child to hospital, whether child came to hospital immediately or not, his/her complains.
- Child's knowledge about NS assessment tool. It included 7 questions related to child's knowledge about NS as definition, causes, types, signs and symptoms, management and prognosis of NS.

Scoring System of Child's Knowledge about NS Assessment Tool: The total questions are 7, questions were in the form of closed ended questions and answers were in the form of correct and incorrect. Each correct answer takes (1) score and wrong answer (0), the total scores of questions was (7), each child obtained score

ranged between 1-3 marks was considered having unsatisfactory knowledge and each child obtained score ranged between 4-7 marks was considered having satisfactory knowledge about NS.

- Child's knowledge about care of NS during hospitalization tool, it included 12 questions related to measuring body weight/day, recording fluid intake and urine out /day,…..etc.

Scoring System of Child's Knowledge about Care of NS During Hospitalization Tool: The total questions are 12, questions were in the form of closed ended questions and answers were in the form of correct and incorrect. Each correct answer takes (1) score and wrong answer (0), the total scores of questions was (12), each child obtained score ranged between 1-4 marks was considered having unsatisfactory knowledge and each child obtained score ranged between 5-8 marks was considered having moderate knowledge and each child obtained score ranged between 9-12 marks was considered having satisfactory knowledge about care of NS.

- Monitoring body weight, fluid intake and urine output record: to record body weight/day, fluid intake and urine out /day for consecutive 5 days.Pilot study

An initial pilot study was done on 10 % of school age children with NS to test the feasibility and to evaluate the content of the tools. School age children with NS included in the pilot study were included in the study.

Ethical Considerations: The control group left to hospital routine management of NS. All children and their relatives included in the study and control groups were informed about the aim, tools and duration of the study after explaining them the benefits of the study. Oral consent of children and their relatives was obtained. Relatives were assured about confidentiality of the data gathered from their children during the study. During the study the researcher investigators informed the children and their relatives about their right to withdraw from the study any time without any effect on the care provided for them.

Validity and Reliability: Content validity was done by 7 experts in the field of pediatric medicine and nursing. Construct validity was done by using constructed groups approach; the mean performance between two groups was significantly different (t= 3.58, p □ 0.001), which supports and gives evidence of construct validity. As regard reliability of tools, Cronbach's alpha between questions was .860. It was obvious that the alpha value is quite high, indicating that the tool demonstrated internal consistency and homogeneity

Procedure: The study was carried out through four phases: preliminary, implementation, follow up and evaluation phases.

Preliminary Phase: This study was conducted after obtaining an official permission from hospital director of the selected setting. This was to explain the purpose of the study and to facilitate data collection. After that oral consents were obtained from children and their relatives who were included in the study after an explanation of the aim, tools, benefits and the duration of the study. The researcher investigators collected the socio-demographic and medical history data through the structured interview, which took about 10-15 minutes from each child.

Implementation Phase

Program Implementation: The total program consisted of 2 sessions carried out in one hour in the same day of collecting socio-demographic data after taking a break about10-15 minutes.

The First Session (Half an Hour): The aim of this session was to make a contract of the work which will start. This contract contained children and their relatives' agreement to participate in the study, program sessions and the schedule of meeting and follow up, children and their relatives' commitment to continue and researcher investigators commitment to help children and their relatives and determination of methods of teaching. During this session pre-program assessment was carried out which included assessing child's knowledge about NS and its care.

The Second Session: (Half an Hour): The aim of this session was to inform the school age children about definition, causes, symptoms and the management of NS. After finishing health teaching session research investigators asked each child in the study group to record amount of the urine output accurately during 24 hours and asked to take/or drink the same amount of oral fluid in the next day, this was done for 5 consecutive days. Teaching method used was discussion, researcher investigators provided booklet to children and their relatives' questions were answered.

Third Phase (The Follow up Phase): The researcher investigators followed with each child during each day of the 5 days monitoring and recording each child's oral fluid intake, urine output and body weight.

Fourth Phase (The Evaluation Phase): Before hospital discharge research investigators evaluate child's knowledge about NS and its care by using child's knowledge about NS and its care tools.

The same steps of the procedure had done for children in both study and control groups except children in the control group were not exposed to second session of implementation phase and were not asked to take/or drink predetermined amount of oral fluid but they were asked to follow hospital routine and there was no health teaching provided to them about NS. The 5 consecutive days were determined for both study and control groups because this is the average hospital stay for children with NS in hospital (every child stays about 6-7 days). Data collection took about 4 months as it started in Oct., 2012 till the end of Jan, 2013.

Statistical Analysis: Data was analyzed using SPSS statistical package version 20. Numerical data were expressed as mean ± standard deviation (SD. Qualitative data were expressed as frequency and percentage). Chi-square test was used to examine the relation between qualitative variables, one way Anova test used to examine the relation between qualitative and quantitative variables. For quantitative data, comparison between two groups was done using t-test comparison within two groups using paired t-test. Pearson (r) Correlation was used to test correlation between variables, P-value $\leq$ 0.05 was considered significant.

RESULTS

Regarding to socio-demographic characteristics of school age children with NS in study and control groups, Figure 1 indicates that more than two thirds (68 % &76% respectively), of both study and control groups were male. Figure 2 shows that (72% & 84% respectively), of school age children of both study and control groups were from rural areas. Figure 3 explains that two thirds (60 % & 68% respectively), of both study and control groups were in primary level of education.

Table 1 reveals that mean age of school age children was 7.360±1.89 years for study group and 7.304±2.427 years for control group and there was no statistically significant difference between both groups regarding to mean of age.

Concerning to children's knowledge about NS, the same table explains that, respectively 84% & 76% of study and control groups had unsatisfactory knowledge about NS and there was no statistically significant difference between both groups regarding to knowledge, Table 1 indicates that (84 %& 92% respectively), of children in study and control groups have unsatisfactory knowledge about care of NS during hospitalization and there was no statistically significant difference between both groups regarding to knowledge about care of NS during hospitalization before providing health education program to children. While the picture was changed and there were statistically significant differences between study and control groups regarding to having knowledge about NS and its care after providing health education program to children as ($P<0.005$).

Table 2 highlights that the mean of body weights of school age children in study group decreased significantly from first day till fifth day consecutively compared to those in control group. In addition, the same table indicates that there were statistically significant differences between study and control groups regarding mean of body weights ($p<0.05$) in all 5 consecutive days, beside that the global comparison between the two groups revealed lower mean scores of body weights of school age children in study group than those in control group with a statistically significant difference between the two groups regarding to total mean of body weights of those school age children ($P<0. 05$).

Regarding to the effectiveness of adjusting oral fluid intake in the study group, Table 3 revealed that, school age children in study group obtained lower mean scores than those in control group from first day till fifth day consecutively with highly statistically significant differences ($p<0.005$). In addition, overall comparison between the two groups indicated lower mean scores of fluid intake of school age children in study group than those in control group with a statistically significant difference between the two groups regarding total mean of oral fluid intake ($P<0.005$).

Table 4 represents a comparison of mean scores of urine output between school age children in study group and control groups. It is clear from Table 4 that highly statistically significance differences were found between the two groups from first day of the study till fifth day as $p<0.005$ in all 5 consecutive days. The same picture was noticed regarding the total mean scores of urine output in both groups, indicating a highly statistically significant difference between study group and control groups ($P<0.005$). It is clear that Tables 2, 3 and 4 proved the first hypothesis of the current study.

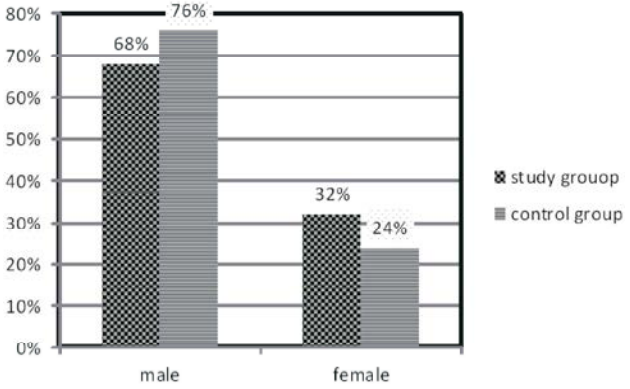

Fig. 1: Comparison of Sex between Study and Control Groups

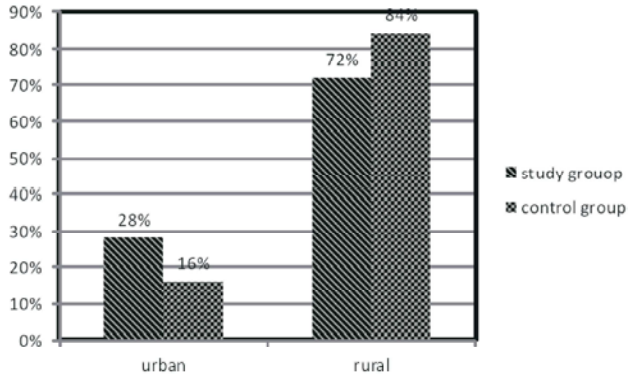

Fig. 2: Residence of Study and Control Groups

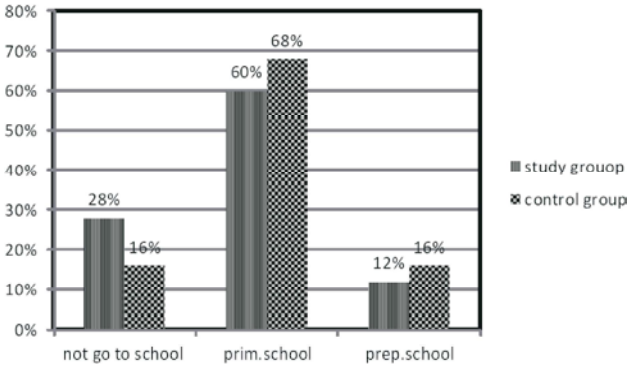

Fig. 3 : Level of Education of Study and Control Groups

Table 1: Comparison between Study and Control Groups Regarding to Demographic Data and Knowledge of Children about Nephrotic Syndrome (No=50).

	Study group (No=25)		Control group (No=25)				
Item	No.	%	No.	%	t-test	χ^2	p-value
Age of children: X ±SD	7.360±1.890	7.304±2.427	.091		. 928		
Having knowledge about NS: before education program:- Satisfactory	4	16	6	24		.500	.480
- Unsatisfactory	21	84	19	76			
Having knowledge about care during hospitalization: before health education program:-Unsatisfactory	21	84	23	92		1.291	.524
-Moderate	2	8	2	8			
-Satisfactory	1	4	0				
Having knowledge about NS: after health education program:- Satisfactory	18	72	6	24		11.538	.001**
- Unsatisfactory	7	28	19	76			
Having knowledge about care during hospitalization: after health education program:-Unsatisfactory	7	28	19	76		10.435	.000**
-Moderate	3	12	2	8			
-Satisfactory	15	60	4	16			

**Significance level at $p \leq 0.01$

Table 2: Comparison of Mean Scores of Body Weight between Study and Control Groups through 5 Consecutive Days (No=50).

Item	Study group (No=25) X ±SD	Control group (No=25) X ±SD	F-test	p-value
Body weight 1st day	29.026±5.324	32.629 ±6.261	4.804	.033*
Body weight 2nd day	29.112±5.347	32.581±6.249	4.445	.040*
Body weight 3rd day	29. 052±5.294	32.514±6.262	4.456	.041*
Body weight 4th day	29. 120±5.388	32.432±6.249	4.026	.046*
Body weight 5th day	29. 052±5.298	32.297±6.253	3.919	.050*
Total mean scores	29.073±5.294	32.491±6.262	4.326	.043*

*Significance level at $p \leq 0.05$

Table 3: Comparison of Mean Scores of Oral Fluid Intake between Study and Control Groups through 5 Consecutive Days (No=50)

Item	Study group (No=25). X ±SD	Control group (No=25) X ±SD	F-test	p-value
Fluid intake 1st day	1046. 20±141.136	1246.40±192.676	17.566	.000**
Fluid d intake 2nd day	1005. 40±118.655	1289.60±155.623	52.725	.000**
Fluid intake 3rd day	967.04±102.569	1343.60±156.575	101.180	.000**
Fluid intake 4th day	931.12±87.231	1362.00±112.250	229.669	.000**
Fluid intake 5th day	900.60±71.463	1379.20±215.018	111.541	.000**
Total mean scores	970.072±102.569	1324.160±156.575	96.039	.000**

**Significance level at $p \leq 0.01$

Table 4: Comparison of Mean Scores of Urine Output between Study and Control Groups Through 5 Consecutive Days (No=50)

Item	Study group (No=25). X ±SD	Control group (No=25) X ±SD	F-test	p-value
Urine output 1st day	1046.20±141.136	1268.80±287.378	12.085	.001**
Urine output 2nd day	1005. 40±118.655	1278.80±216.935	30.564	.000**
Urine output 3rd day	967.04 ±102.569	1333.60±213.773	59.751	.000**
Urine output 4th day	931.12±87.231	2436.80±2892.795	6.767	.012**
Urine output 5th day	900.60±71.463	1402.40±254.252	90.251	.000**
Total mean scores	970.072±87.231	1544.080±254.25	30.968	.000**

**Significance level at $p \leq 0.01$

Table 5: Correlation between Body Weight, Oral Fluid Intake and Urine Output within Study Group

Item	Body weight	Oral fluid intake	Urine output
Body weight	1	R= .873** p=.000	R= .873** p=.000
Oral fluid intake	R= .873** p=.000	1	R=1 .000** p=.000
Urine output	R= .873** p=.000	R=1 .000** p=.000	1

**. Correlation is significant at the 0.01 level (2-tailed)

Table 6: Correlation between Body Weight, Fluid Intake and Urine Output within Control Group

Item	Body weight	Oral fluid intake	Urine output
Body weight	1	R= .493*p=.012	R= .602** p=.001
Oral fluid intake	R= .493*p=.012	1	R=.869**p=.000
Urine output	R= .602**p=.001	R=.869**p=.000	1

*Correlation is significant at the 0.05 level (1-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 5 illustrates in study group that there was positive correlation between body weight and oral fluid intake as r =0.873, p <0.001, there was positive correlation between body weight and urine output as r=0.873, p <0 .001 and there was positive correlation between oral fluid intake and urine output within study group as r=1, p <0.001.

Regarding to Table 6, in control group there was positive correlation between body weight and oral fluid intake as r 0.493, p <0.01, positive correlation between body weight and urine output as r=0.602, p <0.001and there was positive correlation between oral fluid intake and urine output within study group as r= 0.869, p <0.001. It is obvious that Table 5 and 6 proved the second hypothesis of the current study.

DISCUSSION

Children with severe edema of NS are usually hospitalized and treated with intravenous (IV) albumin and diuretics. In contrast to adult, children are often more severely hypoalbminemic and edematous, necessitating hospitalization and IV albumin administration [13, 14]. Therapy for edema is necessary since fluids retention predisposes to infections and can exacerbate preexisting hypertension. Edema with ascites and pleural effusion may cause respiratory embarrassment; edema of intestinal walls may result in diarrhea. Children with edema have restricted daily activities and low self-esteem [15].

It was observed from the results of the current study that mean age of school age children with NS was 7.360±1.890 years in study group and 7.304±2.427 years in control group. This result is in agreement with what was found by Seif *et al.* [16] in their study that the mean age of children with NS in Egypt is 7.7± 2.4 years and Kaptur *et al.* [14] reported that the mean age of study sample of children with NS was 7.6± 4.7 years.

In Egypt, NS among school age children may be common due to lack of immunity and malnutrition diseases of these children due to poverty, lack of hygienic care of those children and illiteracy. In addition, lack of health care services available to children and/or lack of health education to all citizen in general and to this age group specifically. This puts a heavy burden on health care services in Egypt in terms of utilization of hospitals and health care centers. This point of view of research investigators matches with what reported by Nadir *et al*. [17] in their study that there are clear association between risk of NS and malnutrition, illiteracy, unawareness, ignorance towards seriousness of the disease, overpopulation and negligence.

The current study revealed that the majority of school age children in the study and control groups are male. This result is on the same line with results of a study carried out in Egypt by Seif, *et al*. [16] that they found in their study NS is common in males than female children. In Egypt this does not mean NS is common in males than females but may be due to over caring and value of male children which many of Egyptian women and families give it to male children whereas for females, families commonly search another way of treatment as popular medicine or going to nearest pharmacy for consultation.

The current study revealed that the majority of school age children with NS in both groups live in rural area. This result is in the same line with results of study done by Hassan [18] and Seif, Ibrahim *et al*. [16] as they found that the majority of their sample is coming from rural areas. This is because almost hospital referral of cases is to NESPHCU and El-Moneera Educational Pediatric Hospital, Cairo University for better facilities and equipment which in turn reflects/ indicates the burden puts upon those two hospitals due to many cases referred to them daily. This result in Egypt may be related to lack of health care services available in rural areas, lack of all features of healthy life as water supplies, healthy sewage,….etc. in addition to illiteracy of most of the mothers or care givers of children in rural areas, poverty and lack of compliance of people in rural areas with hygienic care.

In relation to level of education of school age children in study and control groups, the present study reported that the majority of these children were in primary and preparatory levels, this is in congruent with what was found by Hassan [18] and Ahmad [19] who found in their study that the majority of school age children are in primary and preparatory levels of education, this gives direction of possibility and simplicity of reaching to those children at schools and is easy to provide them health educational programs about NS and its care especially high relapse rate of this disease in school age children.

Regarding to mean scores of body weights between study and control groups through 5 succeeding days, the present study indicated to the presence of statistically significant differences between both groups. The differences between body weights reflect the positive

effects of adjustment of oral fluid intake on body weight, edema and generally child's condition. This result is in agreement with what reported by Pruvost*, et al.* [20] and Kliegman [21], who reported that child's fluid intake, urine output and body weight are cornerstones of child's hydration state and focused on positive relation between fluid intake and body weight and urine output and an accurate daily measurement of them is critical for the management of child.

Concerning to mean scores of oral fluids intake between study and control groups through 5 consecutive days the present study indicated highly statistically significant differences between both groups. Research investigators' main concern is correction of intravascular fluid deficit and believe that it is important to give nephrotic child adequate fluids intake according to child's urine output and do not allow child to drink as he/she wish to avoid over hydration especially child is edematous and also do not restrict fluids intake from child to avoid hypovolemia and increasing worsening of intravascular fluids deficit which in turn predisposes nephrotic child to many of complications such as venous thrombosis [18].

The results of current study are in compatible with what found by Kapur, *et al*. [14] as they found in their study that restriction of fluid intake to urine output with diuretic therapy alone has a positive effect on controlling of edema of children. Pais and Avner [5] reported in their study that fluid restriction to urine output necessary especially if the child is hyponatremic. Also this result matches with what reported by Hughes [22] as he reported that fluid restriction to urine output helpful in limiting the increase in edema. Nadir *et al*. [17] found in their study that children with NS may have problems in regulating their body's water balance. This can cause fluid retention, the child who having NS may include fluid restriction to their urine output. These restrictions in the fluid may help to regulate a child's fluid balance.

The results of the current studies are on the same line with results found by Guha *et al*. [4] as they reported in their study that children with NS is a highly edema phenomenon, so the water have a certain exquisite, should be based on how much urine output and edema grasp the intake of water level. Also Konder [6] and Gipson *et al*. [23] in agreement with current results as they reported in their studies that children need to restrict oral fluid intake (input) relative to output accurately to determine fluid replacement needs and kidney function and reduce the risk of excess fluid.

But these results contradict with results reported by Avasudevan *et al*. [15] as reported in their study that no restriction of water is necessary in most of the children. They added that restriction of water intake is necessary only in children with edema refractory to other measures, particularly when associated with reduced urine output. In this case fluid intake is restricted to insensible fluid losses and urine output in these cases.

As regards to mean scores of urine output between study and control groups through 5 consecutive days the present study indicated highly statistically significant differences between both groups which reflects the positive relationship between adjustment fluid intakes on urine output. The results of present study in accordance with what reported by Wong [24] as stated that water is essential substance of life but, because of special illness, NS children cannot drink as much as they want. Children with NS need to limit water intake because of serious swelling symptom. In NS swelling symptom is caused by great loss of protein from urine. Therefore the more protein in urine the more serious the swelling is and also the water children should drink. Although the fluid intake differs from child to child for NS children, but they generally can follow a principle and that is they can drink water equal urine output of the day before plus their insensible water loss.

Actually in clinical settings of hospital the routine care of nephrotic child many physicians instructed nephrotic child to restrict fluid intake, the aim of physicians in that is to avoid fluid over load especially that the child is edematous and should avoid cardiac overload and respiratory problems. Research investigators believe in that but what about if the signs and symptoms of hypovolemia appeared on child, on the other side many physicians instructed nephrotic child to drink fluid as he/she wishes, their aim to avoid hypovolemia, this is better to give fluid beside other medical therapy, but how much fluid should allowed to the child to drink, finally nephrotic child and his/her care giver find themselves confused to drink fluid as they wish or restrict fluid.

Concerning to positive relations between body weight, oral fluid intake and urine output, the results of current study supported by what was found by Luncher *et al*. [25], as they highlighted in their study that urine output is influenced by water intake and presence of positive correlation between water intake and urine output and they found also a relationship between body weight and water excretion.

The current study concluded that adjusting oral fluid intake and urine output is effective in decreasing edema among school age children with NS. This is manifested by decreasing body weight of school age children in study group after adjusting their oral fluid intake according to their urine output, while minimal change in body weights of school age children in control group, in addition, the study concluded that positive relation between decreasing oral fluid intake and decreasing urine output and decreasing body weight and this proved the hypotheses of the current study.

Based on the results of the current study, the following recommendations were reached: Adjustment oral fluid intake according to urine output should be applied for all children with NS. Replication of such study on different age groups and different settings to be able to generalize the results of current study. Further studies needed to examine if there are other factors that can influence edema in children with NS. Provision of health education programs and handouts, booklets for children and their relatives with NS about care of NS especially fluid intake.

REFERENCES

1. Wong, D.L., 2009. Whaley and Wong's essential of pediatric nursing. Mosby Year Book, pp: 960-966.
2. Einstein, A., 2009. Pediatrics in review. Available on line at http//pedsinreview.aappublications.org accessed at 15/2/2013.
3. Fahmi, N., 2013. Nephrotic syndrome, Baghdad medical college. Available on line at www.pubmed.com. Accessed at 7/1/2013.
4. Guha, P., A. De. and M. Ghosal, 2009. Behavioral profile of children with nephrotic syndrome. Indian J. Psychiatry, 51: 122-126.
5. Pais, P. and E.D. Avener, 2011. Idiopathic Nephrotic Syndrome. Kliegman: nelson textbook of pediatrics, Available at www.pubmid.com, accessed at 15/2/2013.
6. Konder, C., 2009. Nephrotic syndrome in adults: diagnosis and management. American Family Physician, 80: 1129-1134.
7. Gipson, D.S., S.F. Massengill, L.Yao, S. Nagaraj, W.E. Smoyer, J.D. Mahan, D. Wigfall, P. Miles, L. Powell, J.J. Lin, H. Trachtman, L.A. Greenbaum, 2009. Variability in childhood onset of nephrotic syndrome management in North America. 2009 in Press.
8. Agha, I.A., 2013. Nephrotic syndrome. Available on line at www.med.cam.ac.uk. Accessed at 12/1/2013.
9. Wong, L., L. Hockenbrerry and N. Wilson, 2012. Maternal and child nursing care. Mosby Company, pp: 1468-1471.
10. Wong, D.L. and M.J. Hockenbrerry, 2011. Nursing care of infant and children. Mosby ICC, pp: 1274-1279.
11. Lane, J.C., 2013. Pediatric nephrotic syndrome clinical presentation. Available on line at http// medinine.medscape.com. Accessed at 24/2/ 2013.
12. Hodson, E.M., J.F. Knight, N.S. Wills and J.C. Craig, 2005. Corticosteroid therapy for nephrotic syndrome in children. Cochrane Database Syst Rev, CD001533.
13. Kaddah, A., S. Sabry, E. Emil and M. El-Refaey, 2012. Epidemiology of primary nephrotic syndrome in Egyptian children. J. Nephrol., 25: 732-737.
14. Kapur, G., R.P. Valentini, A.A. Imam and T.K. Matto, 2009. Treatment of severe edema in children with nephrotic syndrome with diuretics alone-A prospective study. Clin J. Am. Soc. Nephrol., 4: 907-913.
15. Avasudevan, A., M. Mantan and A. Bagga, 2004. Management of edema in nephrotic syndrome. Indian pediatrics, 41: 787-795. Available at Web: www.ns/aug-787-795.htm, 12/1/2013.
16. Seif, E.I., E.A. Ibrahim, N.G. Elhefnawy and M.I. Salman, 2013. Histological pattern of idiopathic steroid resistant nephrotic syndrome in Egyptian children: a single centre study. Journal of Nephrology, 2:53-60.
17. Nadir, S.J., N. Saleem and F. Amin, 2011. Steroid sensitive nephritic syndrome in pediatrics. Pak. J. Pharm. Sci., 24: 207-210.
18. Hassan, A.M., 2013. Impact of cryotherapy on pain intensity at puncture sites of arteriovenous fistula among children undergoing hemodialysis, M.D. thesis, in Pediatric Nursing. Faculty of Nursing, Cairo University.
19. Ahmad, A.S., 2008. Stressors as perceived by children undergoing hemodialysis. Published master thesis, Faculty of Nursing, Alexandria University.
20. Pruvost, I., F. Dubos, E. Chazard, V. Hue, A. Duhamel and A. Martinot, 2013. The value of body weight measurement to assess dehydration in chidren. PLoS One, 8: e 55063.
21. Kliegman, N., 2013. Deficit therapy "monitoring and adjusting therapy. Saunders, an Imprint of Elsevier Inc. Available on line at www.mdconsult.com/books/ page. Accessed at 12/1/2013.

22. Hughes, D., 2012. Guideline for the management of idiopathic nephrotic syndrome of children. Available on line at www. http:// health.hpathy.com/nephrotic syndrome-symptoms-treatment-cure.asp.
23. Gipson, D.S., S.F. Massengill, L.Yao, S. Nagaraj, W.E. Smoyer, J.D. Mahan, D. Wigfall, P. Miles, L. Powell, J.J. Lin, H. Trachtman, L.A. Greenbaum, 2009. Management of childhood onset of nephrotic syndrome. Pediatrics, 124: 747-57.
24. Wong, W., 2007. Idiopathic nephrotic syndrome in New Zealand children, demographic, clinical features, initial management and outcome after twelve-month follow up: results of a three year national surveillance study. J. Paediatr Child Health, 43: 337-341.
25. Luncher, J.A., A.D. Hall and V.L. Kremer, 1950. Treatment of nephrosis with concentrated human serum albumin. II. Effects on renal function and excretion of water and some electrolytes JCl Invest, 29: 896-904. Available at Web: www.ncbi.nih.gov/ pmc/articles. Accessed at 7/5/2013.