**RESEARCH ARTICLE**

# A Study to evaluate the Effectiveness of Planned Teaching Program regarding Prevention of Renal Calculi in Terms of Knowledge and Dietary Pattern of Primary School Teachers of Moodabidri, Dakshina Kannada District

**Giriraj Prasad Soni**

## ABSTRACT

**Introduction:** A renal calculus is a painful condition. Renal calculi occur in up to 15% population. The incidence of calculi is 100 to 400 out of 1,00,000 people from a renal calculi every year. Dietary practice of the individuals has a direct influence over the stone formation. Change in dietary habits and lifestyle are suggested to contribute markedly to the rise in the prevalence and incidence of urolithiasis.

**Materials and methods:** An evaluative approach with one group pretest design was adopted in order to evaluate effectiveness of planned teaching program on prevention of renal calculi and dietary practice among primary school teachers in Moodbidri. The conceptual framework adopted for the study was based on modified Rosen stocks health belief model. Convenient sampling was used to select the sample for the study. Data collected from the sample were analyzed by descriptive and inferential statistics. The final sample size was 70.

**Results:** Majority of samples belonged to age group 20 to 30 years (54.28%), female (62.85%), D.Ed. students (64.28%), married (60%), hindu background (62.85%), teaching experience below 10 years (65.71%), source of health-related information by books (48.57%) and mixed diet (61.42%).
- There was significant difference between pretest and post-test knowledge scores ($t_{69}$ = 36.46, $p < 0.05$ significant)
- There was no significant association between pretest knowledge and selected demographic variables age ($x^2$ = 1.33, $p > 0.05$), sex ($x^2$ = 0.568, $p > 0.05$), religion ($x^2$ = 0.843, $p > 0.05$), diet ($x^2$ = 0.003, $p > 0.05$).
- There was a significant difference between pretest and posttest dietary practice scores ($t_{69}$ = 32.27, $p < 0.05$, significant).

**Conclusion:** The findings of the study show that the planned teaching program was effective in all the areas in improving the knowledge and dietary practice of primary school teachers and, thus, reduced complication. It also helped them to take self responsibility for their own health.

Dean cum Principal

Department of Nursing, Mahatma Gandhi Nursing College, Sitapura, Jaipur, Rajasthan India

**Corresponding Author:** Giriraj Prasad Soni, Dean cum Principal, Department of Nursing, Mahatma Gandhi Nursing College, Sitapura, Jaipur, Rajasthan, India

## INTRODUCTION

Renal calculus is a painful condition. Renal calculi occur in up to 15 % of the population. Every year 100 to 400 out of 1,00,000 persons are diagnosed with renal calculi.

Nowadays, about 85% of all kidney stones contain calcium salts (calcium oxalate and/or calcium phosphate) as their main crystalline component.[1] Because human urine is commonly supersaturated with respect to calcium salts as well as to uric acid, crystalluria is very common, i.e., healthy people excrete up to ten million microcrystals everyday.[2]

One of the major aspects of lifestyle is food habits or dietary practices. Many research studies show that the dietary practices of the individuals have a direct influence over stone formation. Nutritional risk factors for stone disease are well-known. They include excessive consumption of animal proteins, sodium chloride, and rapidly absorbed glycerides, and insufficient dietary intake of fruits and potassium-rich vegetables, which provide an alkaline load. As a consequence, an excessive production of $H^+$ ions may induce several urinary disorders including low urine pH, high urine calcium and uric acid excretion, and low urine citrate excretion. Excessive calorie intake and high chocolate consumption induce hyperoxaluria; low water intake is another factor that favours high concentration of solutes in urine. Restoring the dietary balance is the first advice to prevent stones.[3]

Changes in the dietary habits and lifestyle are suggested to contribute markedly to the rise in the prevalence and incidence of urolithiasis during the past

decades. Insufficient fluid intake and diet rich in animal protein are considered to be important determinants of stone formation. Overweight as associated with dietary pattern additionally contributes to the increasing incidence and prevalence of stone disease. There is evidence that change in dietary habits can reduce urinary risk factors and the risk for stone formatioin.[4]

"Renal calculi—is nutrition a trigger or treatment?". Since urinary super saturation—the driving force for crystallisation and stone formation—directly depends on nutritional habits. Dietary recommendations are an important part of stone treatment. Incorrect dietary recommendations, such as the restrictions of calcium as advocated for decades, can promote stone formation. Epidemiological studies confirm that a diet rich in meat protein carries an increased risk for forming upper urinary tact stones; thus, daily protein intake should not exceed 1 g/kg body weight, which corresponds with general recommendations for a healthy diet. More recent studies have shown that the consumption of high quantities of fruits and vegetables may protect against kidney stone formation.[1]

Diet teaching is found to be one of the most effective methods in terms of enhancing awareness and reducing costs to bring about changes in people's dietary practices.[5]

## OBJECTIVES

- Determine the pretest knowledge of primary school teachers on prevention of renal calculi in terms of knowledge and dietary pattern.
- Plan, validate and administer a teaching program on prevention of renal calculi.
- Evaluate the effectiveness of planned teaching program on prevention of renal calculi.
- Find out significant association between the primary school teachers' pretest scores and selected variables, such as age, sex, religion and diet.

## MATERIALS AND METHODS

The research design adopted for the present study was one group pretest posttest design. This design was adopted to assess the knowledge gain on the prevention of renal calculi, change in the dietary practices of primary school teachers following the administration of planned teaching program.[6] The present study was conducted in all the primary schools of Moodabidri, Dakshina Kannada. In the present study, population consists of all primary school teachers teaching in the primary schools of Moodabidri, Dakshina Kannada.

The sample for the current study consisted of 70 primary school teachers teaching in the selected primary schools of Moodabidri, Dakshina Kannada. For the present study, convenience sampling technique was used.

The present study aimed to evaluate the effect of planned teaching program on the prevention of renal calculi; so structured knowledge questionnaire and dietary checklist were developed as the tool to collect date.

For the pretesting, modified version of the tool in English was carried out in Rotary English Medium School, Moodabidri. Ten primary school teachers who met the criteria were selected. The respondents found the language of the questionnaire and dietary checklist simple and under stable. The average time taken to complete the tool was 20 minutes and was acceptable to the subjects.

The data were collected from 70 primary school teachers. The subjects were asked to participate in the study after self-introduction by the investigator. The teachers were informed of the purpose of the study and consent was taken from them. Pretest was administered to each primary school teachers on various days followed by the administration of the teaching program. Charts and blackboard were used to facilitate the understanding of the teaching. The teaching program required 50–50 minutes.

The method of instruction adopted was lecture cum discussion. After the teaching session, the subjects were asked to clarify their doubts.

Posttest was conducted using the same questionnaire on the 25th day of teaching.

## RESULTS

The data presented in Table 1 shows that 't' value computed between pretest and posttest scores is statistically significant at 0.05 level of significant. The calculated 't' value (36.14) in greater than table value ($t69=$ 1.96). Hence, the null hypothesis is rejected and research hypothesis is accepted at 5% level of significance. This

**Table 1:** Mean, mean deviation (MD), standard deviation (SD), t-value between pretest and posttest knowledge scores of primary school teachers

|  | Mean | Mean deviation | Standard deviation | Standard error | t-value |
|---|---|---|---|---|---|
| Pretest | 17.185 | 2.302 | 2.98 | 0.356 | 36.14 |
| Posttest | 30.171 |  |  |  |  |
| Table 't' = 1.96; p < 0.05 | | | | | |

**Table 2:** Mean, mean deviation, standard deviation and t-value between pretest and posttest dietary practice scores of primary school teachers

|  | Mean | Mean deviation | Standard deviation | Standard error | t-value |
|---|---|---|---|---|---|
| Pretest | 43.39 | 2.89 | 3.66 | 0.438 | $T_{69}$ = 32.37 |
| Posttest | 29.26 |  |  |  | (P < 0.05) |

Table value for $t_{69}$ = 1.96

shows that the planned teaching program was effective in improving knowledge of primary school teachers regarding prevention of renal calculi.

The data presented in Table 2 shows that the obtained 't' value was 32.37, which significant at 0.05 level. Hence, the researcher failed to accept the null hypothesis and accepted the research hypothesis indicating that the change in dietary practices is not by chance.

## DISCUSSION

To evaluate the impact of diet counseling on patient suffering from renal stone found that intensive diet counseling resulted in change of attitude of patients toward healthy practices and also there was significance reduction in calcium, and phosphorus level in serum and urine. In case of oxalate the reduction was not statistically significant.[6,7]

Findings of the study show that in the pretest most of primary school teachers (97.4%) had average knowledge regarding renal calculi and its prevention. This indicates that less number of primary school teachers had adequate knowledge regarding renal calculi and its prevention.[8]

The findings of the study revealed that there was a significant difference between pretest and posttest knowledge scores. The pretest mean percentage knowledge score regarding prevention of renal calculi were found to be less than posttest mean percentage knowledge scores.[9,10,11]

The 't' test computed to find the difference between the pre-test post-test dietary practice scores of primary school teachers showed that obtained 't' value was 32.37 at 0.05 level of significance. Hence, researcher failed to accept null hypothesis and research hypothesis accepted, indicating that the planned teaching program is effective.

## LIMITATION

The limitations recognized in the study are as follows:
- The study did not use control group. Hence, the result of the study must be generalized with caution as there is threat to internal validity due to history.
- Incidental teaching by other health personnel could not be controlled in between pretest and posttest because of ethical reason.

## CONCLUSION

The findings of the study show that the planned teaching program was effective in all the areas in improving the knowledge and dietary practice of primary school teachers and, thus, reduced complication. It also helped them to take self responsibility for their own health.

## REFERENCES

1. Wahl C, Hess B. Kidney calculi—is nutrition a trigger or treatment? Ther Umsch 2000 Mar;57(3):138-145.
2. Hess B. Pathophysiology, diagnosis and conservative therapy in calcium kidney calculi. Ther Umsch 2003 Feb;60(2):79-87.
3. Daudonn M. Epidemiology of nephrolithiasis in France. Annn Urol (Paris) 2005 Dec;39(6):209-231.
4. Siener R. Impact of dietary habits on stone incidence: Urol Res 2006 Apr;34(2):131-133.
5. Taylor EN, Curhan GC. Diet and fluid prescription in stone disease. Kidney int 2006 Sep;70(5):835-839.
6. Paul M, Devi BS. Urinary chemistry and composition of urinary stone of selected urinary stone formers. Indian J Nutr Diet 2002;39:55-60.
7. Vasanthamani G, Sushmitha. Impact of diet counseling on patients suffering from urinary stone. Indian J Nutr Diet 1997;34(2):24-28.
8. Polit DF, Beck CT. Nursing research: principles and methods. 3rd ed. Philadelphia: J B. Lippincott Company; 2004.
9. Taylor EN, Stampfer MJ, Curhan GC. Dietary factors and the risk of incident kidney stones in men: new insights after 14 years of follow-up. J Am Soc Nephrol. 2004 Dec;15(12):3225-3232.
10. Hesse A, Brandle E, Wilbert D, Kohrmann KU, Alken P. Study on the prevalence and incidence of urolithiasis in Germany comparing the years 1979 *vs* 2000. EUr Urol 2003 Dec;44(6)709-713.
11. McHarg T, Rodgers A, Charlton K. Influence of cranberry juice on the urinary risk factors for calcium oxalate kidney stone formation. BJU Int 2003 Nov;92(7):765-768.