SCREENING OF KIDNEY DYSFUNCTION AND ITS ASSOCIATED RISK FACTORS AMONG PUBLIC SCHOOL LEARNERS IN LA UNION NATIONAL HIGH SCHOOL, CITY OF SAN FERNANDO, LA UNION

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This research was carried out as part of an academic requirement of LORMA Colleges' College of Medical laboratory Science. By assessing renal health and identifying the potential risk factors for kidney dysfunction among public school learners, it seeks to support school-based health screening. With the approval of parents as well as their willingness for involvement, the study was carried out in an ethical manner. The LORMA College Research Ethics Committee gave ethical clearance, as well as all biosafety along research regulations were adhered to. The results are restricted to the chosen participants and are intended to encourage early prevention and awareness in school communities.

Abstract

This study aimed to detect early signs of kidney dysfunction and its relationship with physiological, demographic, and behavioral risk factors among public secondary learners at La Union National High School. Using a descriptive-correlational research design, 20 participants (65% male, 35% female) underwent urinalysis screening, including albumin-creatinine ratio (ACR), alongside physiological profiling and structured questionnaires. Findings showed a high prevalence of abnormal renal markers, with 18 of 20 respondents (90%) identified by the physician as having kidney dysfunction, while 2 (10%) were normal. Among abnormal cases, hematuria was detected in 15 (75%) respondents, proteinuria (albuminuria) in 14 (70%), and bilirubinuria in 12 (60%) based on urinalysis parameters. Physiological assessment revealed that 50% had abnormal Body Mass Index and 55% had abnormal core temperature, while most maintained normal blood pressure. However, one-way ANOVA showed no significant differences between kidney dysfunction and age, gender, BMI, pulse rate, blood pressure, and temperature. Participants demonstrated "excellent" hydration practices (mean = 3.26) and "good" dietary and drug intake habits, yet these behaviors had no significant association with kidney dysfunction findings. The results emphasize the need for early school-based kidney screening and confirmatory testing among learners who may appear asymptomatic or low-risk.

Keywords*: Albumin-Creatinine Ratio (ACR), Behavioral Risk Factors, Kidney Dysfunction, Physiological Risk Factors, Public Secondary Learners, Renal Health, School-Based Screening, Urinaly*

1. Introduction

Kidney has an important role of maintaining the body's balance through the regulation of fluid levels, removal of waste products, as well as controlling concentrations of electrolytes. Regardless of its importance, kidney dysfunction may still remain asymptomatic in its early stages, making early detection especially crucial for the prevention of lone-term problems.

Behaviors of adolescents like inadequate hydration and poor dietary intake, along with the inappropriate use of medication can contribute to renal health risks. Environmental factors may also contribute to the progression of kidney dysfunction among adolescents.

Screening programs can offer a prospect for the early identification of potential renal abnormalities but urinalysis is recognized as an easy, non-invasive method which can aid in the early detection of markers for kidney dysfunction like hematuria, proteinuria, or even microalbuminuria. This study was conducted to screen for kidney dysfunction and its associated risk factors among public school learners in La Union National High School, City of San Fernando, La Union

2. Objectives

The study aimed to detect early kidney function changes through urinary biomarkers among La Union National High School learners in San Fernando City, La Union. Specifically, it sought to answer the following questions:

1. What was the health profile of the learners in terms of:
    a. BMI
    b. Pulse rate
    c. Blood pressure
    d. Temperature
2. What was the demographic profile of the learners in terms of:
    a. Age

   b. Grade Level
   c. Gender
3. What was the prevalence of kidney dysfunction among the learners based on the urinalysis results as validated by a physician's diagnosis?
4. Was there a significant difference on the prevalence of kidney dysfunction among learners when grouped according to their health and demographic profile?
5. What were the risk factors to kidney dysfunction among public school learners in terms of:
   a. family history,
   b. diet,
   c. water intake, and
   d. drug intake?
6. Was there a significant relationship between identified risk factors and the prevalence of kidney dysfunction among public school learners?

3. Materials and Methods

3.1 Research Design

This study used a quantitative, descriptive, cross-sectional, and correlational research design that is aimed at finding the prevalence of kidney dysfunction among learners in La Union National High School. This allowed for the collection of data on the status of kidney health as well as to explore the potential associations between kidney dysfunction markers and the selected demographic and health-related variables.

3.2 Population and Locale of the Study

The study was implemented in La Union National High School and 20 leaners were selected as participants using stratified random sampling method across grade levels as well as genders to reduce sampling bias.

3.3 Inclusion and Exclusion Criteria

Inclusion criteria:

1. Learners who were enrolled currently in a public school in the City of San Fernando, La

Union.

2. Learners who had parental consent and for whom learners assent form were available.
3. Learners who were available during the slated time of data collection.

Exclusion criteria:

1. Included learners who have known kidney disease or those who have medication that affects their renal function.
2. Learners without parental consent or those who are not willing to participate.

3.4 Data Gathering Tools

The data gathering tools used in this study were categorized into primary and secondary instruments. The primary data gathering tool consisted of:

a. Physical examination (color and clarity)
b. Chemical testing using reagent strip dipsticks
c. Microscopic examination for cells and formed elements
d. Microalbumin testing to detect early kidney damage.

Complementing clinical findings, a structured questionnaire that is expert-validated served as the secondary data gathering tool to collect data related to:

a. Demographic profile and possible risk factors, consisting of sections on family history, dietary intake, water intake, as well as drug intake.

Additionally, standardized instruments like weighing scale, tape measure, sphygmomanometer, thermometer, as well as a timer were used to get accurate measurements of weight, height, vital signs, and computation of Body Mass Index (BMI).

3.5 Urine Sample Collection, Transport, and Laboratory Analysis

After collection, the labeled urine specimens were placed in a clean transport container with ice packs to maintain temperature range of 2–8°C. the specimens are then transported to the testing facility and were analyzed within 1-2 hours to prevent cellular degradation or even chemical changes. All results underwent validation by a licensed medical technologist and were interpreted by a licensed physician.

3.6 Data Collection

A validated questionnaire governed the parents of the learners to collect data on their demographic profile and risk factors. Health profiles were assessed by measuring height, weight, pulse rate, blood pressure, as well as temperature with the use of standardized instruments. Body Mass Index was calculated from height and weight measurements.

3.7 Treatment of Data

Descriptive statistics like frequency count, mean, as well as percentage were employed to outline the learners' demographic profile and health-related traits. One-way ANOVA was used to determine if health and demographic profiles had significant differences in the prevalence of kidney dysfunction. Pearson Correlation Coefficient was also utilized to determine significant relationships between dietary intake, drug intake, water intake, family history and the prevalence of kidney dysfunction. The significance level was set at 0.01.

4. Results

4.1 Health Profile of the Respondents

The data shows that 10 (50%) learners have a normal reading in their BMI, while the other 10 (50%) have abnormal results, which indicates the need for regular physical activity as well as an improved dietary intake. These findings are indicative that half of the learners are at risk of developing Kidney Dysfunction (KD).

4.2 Dietary intake

The Grand mean of 2.97 indicates a Good Dietary Intake. The highest mean score was 3.85 (the practice of not skipping meals or eating at irregular times), categorized as Excellent. Conversely, the consumption of processed or packaged foods received the lowest mean score (1.9), it was interpreted as Fair Dietary Intake.

4.3 Water intake

Our data presented a grand mean of 3.26, which is categorized as Excellent Hydration Practices. The greatest mean score of 3.65 was perceived in ensuring the availability of safe drinking water at home. The lowest mean score of 2.8 was observed in drinking very little water during school hours, indicating inconsistent hydration behavior regardless of adequate access to water.

4.4 Family history of kidney disease

Data displays a Grand mean of 2.65, which is categorized as No Risk. The greatest mean score was from response on whether the child had been hospitalized because of urinary tract infection (2.9). The lowest mean score (2.4) was perceived for kidney or urinary tract problems that occur repeatedly in your family, implying that genetic inclination is not prevalent in this group.

4.5 Prevalence of kidney dysfunction

The population consisted of school-based learners who undertook screening. 18 out of 20 (90%) showed abnormal urinalysis results and 2 (10%) were assessed as normal in spite of high-normal albumin-creatinine ratio. These findings is indicative that most of the screened learners already display urinary abnormalities suggestive of early changes in renal function.

4.6 Relationship Between Risk Factors and Kidney Dysfunction

Statistical analysis have showcased that there are no significant differences in the prevalence of kidney dysfunction according to BMI, pulse rate, temperature, age, grade level, and gender, as all derived p-values have exceeded the 0.01 significance level. For the relationship between identified risk factors and the prevalence of kidney dysfunction, family history ($r = -0.177$), dietary intake ($r = -0.114$), water intake ($r = 0.557$), as well as drug intake ($r = 0.424$) have all failed to reach the critical value of ±0.561 at the 0.01 significance level, which indicates no significant relationship.

5. Discussion

Half of the learners had abnormal BMI and over half had abnormal temperature, yet there are no significant differences found between these indicators and kidney dysfunction, and is suggestive that renal changes remain subclinical in adolescents due to strong renal functional reserve.

Ninety percent of participants (90%) were identified to have kidney dysfunction based on urinalysis and elevated ACR, with proteinuria being the most common abnormality (50%), this highlights the need for school-based screening.

Participants displayed excellent hydration practices as well as good dietary and drug intake habits, with family history establishing no risk, but there are no significant relationship found between these factors and kidney dysfunction prevalence.

All the p-values have exceeded the 0.01 significance threshold, which leads to the acceptance of the null hypotheses. This indicates that kidney dysfunction lacks statistically significant associations with the demographic as well as the physiological variables evaluated in this study.

6. Conclusion

The study states that while the learners maintain strong cardiovascular health, the high incidence of abnormal BMI as well as abnormal temperature is suggestive of underlying health or environmental stressors. No significant differences in kidney dysfunction prevalence were found across BMI, pulse rate, temperature, age, grade level, and gender, which indicates that these parameters cannot serve as definitive predictors.

Majority of the students (90%) were identified with kidney dysfunction based on urinalysis validated by a licensed physician, with proteinuria being the most common abnormal finding. Participants have maintained a low-risk profile with an excellent hydration practice as well as good dietary habits, while family history showcased no prominent hereditary predisposition.

The study have not revealed statistically significant relationship between the identified risk factors (family history, dietary intake, water intake, drug intake) and the prevalence of kidney dysfunction among the learners, which suggests that variations in kidney function may instead be influenced by other unmeasured factors.

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9. Author(s) Biodata (50 words)

As part of their academic requirement, the authors, third-year students at LORMA Colleges' College of Medical Laboratory Science in Carlatan, City of San Fernando, La Union, carried out this study. Clinical laboratory diagnostics, disease screening, and community health studies aimed at early diagnosis and prevention of health issues among school-aged populations are among their areas of interest.