

Forum Theater as a Participatory and Edutainment Theatre to Sensitize Farming Community and School Children on Chronic Kidney Disease of Unknown (CKDu) in Sri Lanka

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ABSTRACT

The study aimed to evaluate the effectiveness of forum theatre as a participatory and edutainment theatre designed to sensitize farming communities and school children on chronic kidney disease of unknown etiology (CKDu) and its mitigation strategies. Four forum theatre programmes targeting students and three community programmes were conducted, after a social survey and key informant discussions, which aimed to identify gaps in information and communication, as well as the essential messages that needed to be conveyed. The potential causative factors for CKDu, including fluoride in drinking water in conjunction with water hardness, as well as the symptoms of the disease, prevalent myths, consequences of the misuse of agrochemicals, necessity for scientific understanding of the issue and mitigatory strategies were identified as the primary messages intended to be communicated through the drama. Descriptive and inferential statistical analyses demonstrated a significant enhancement in the overall knowledge and attitudes of the participants following the performance. Evidence from photographs, videos, and observations indicated that the audience's general attention and interest were consistently maintained throughout the forum theater performances. Both students and community members actively engaged as spect-actors when given the opportunity. Moreover, the forum theatre provided a platform for students and community members to critically analyze the issue while proposing practical solutions themselves. Thus, forum theatre proves to be an effective method for communicating health and agricultural messages, representing an innovative approach to participatory and educational-entertainment theatre aimed at disseminating information to farming communities, including school children.

Keywords: Chronic Kidney Disease, Edutainment, Forum Theatre, Participatory Communication

INTRODUCTION/NEED FOR STUDY

Chronic Kidney Disease of Uncertain Etiology (CKDu)

Diabetes and hypertension are the major risk factors for the commonly identified chronic kidney disease (CKD) globally (Weaver et.al., 2015). Chronic Kidney Disease of uncertain etiology (CKDu) is an emerging hidden threat to human health, and it has expanded to 35 countries in the world, including hot spots in Asia, Central America, Africa, and the Middle East. CKDu patients gradually lose their renal function without showing initial symptoms until reaching complete kidney failure and eventually death (Gunasekara et al., 2020). "Given the extremely high mortality and morbidity reported with this disease, efforts to identify the cause(s), prevent future cases, and provide care for those affected must be a global priority" (Priyadarshani et.al., 2023). CKDu has become a serious environmental and public health issue in Sri Lanka over the last two decades. Consequently, it has become a leading cause of death in high-prevalence areas, especially in the North Central Province (NCP) of the country. The victims are mostly men engaged in farming

occupations. The most vulnerable age group is 40 to 60 years, which means those who are at their economically productive age (Ranasinghe et.al., 2019).

Traditionally, diabetes and hypertension cause chronic kidney disease (CKD), but the reasons for the newly emerged type of CKD are still unidentified. Therefore, it is known as the chronic kidney disease of uncertain etiology (CKDu). However, the researchers have suggested that heavy metals (Arsenic & Cadmium) released from agrochemicals, fluoride in drinking water in combination with water hardness, heat stress, herbal drinks used in Ayurveda medicine, and snake-bites as the causative agents (Jayatilake et.al., 2013; Singh et. al., 2020; Wasana et al., 2016; Wimalawansa, 2016). These factors are closely connected with livelihoods (farming), environment, and sociocultural factors of the rural community. Therefore, the problem and its impacts are complex and multidimensional, with many affected, influential, and related stakeholders. Declining in productivity and earning potential, reduction in quality of life, monetary loss, and inability to sufficiently provide for their families are the major consequences of CKDu on the affected families, leading to a negative impact on national income (Elledge et.al., 2014). In this context, it is necessary to raise awareness, knowledge, and attitudes of the affected and vulnerable communities and all other stakeholders of the issue in mitigating the problem. Moreover, full public engagement is required with necessary behavioral actions.

Education and communication of CKDu

According to Priyadarshani et.al. 2023, mitigation steps for CKDu include the provision of shelters, reduction of strenuous labour, the use of eco-friendly agrochemicals, and the use of purified water. Educational and communication programmes play a key role in communicating these relevant messages to the community. The public health system of the country is bureaucratic, and the regional Medical Offices of Health (MOH) are involved in public health at the community level with Public Health Inspectors (PHI) who are the ground-level health officers communicating directly with the community. The community (including farmers), health institutes and officers, water board, department of agriculture and agriculture officers, researchers, policy makers, and media are some of the important stakeholders in this issue. However, these responsible government institutes are under separate ministries. Misunderstanding, misinterpretation, and miscommunication are some of the issues related to the problem of CKDu. According to a science communication journalist (Gunawardene, 2013), “as health officials and policy makers struggle with the prolonged humanitarian emergency, media coverage often adds to public confusion and fear.” Therefore, right communication at the right time and collective actions among the relevant stakeholders are also similarly important while medical interventions are implemented to mitigate the problem. Early diagnosis of the disease is one of the important medical aspects.

A significant amount of empirical literature is available on CKDu in Sri Lanka. However, the focus of much of this research is to describe the incidence, prevalence, trends, and causative factors and control of the disease from the medical and epidemiological perspectives, but social and behavioral studies, which would be helpful to plan mitigatory measures, are meager. Understanding the related Knowledge, Attitude, and Practices (KAP) of the affected and vulnerable communities to the disease is important in designing, developing, and implementing the strategies to mitigate the problem. The relevant messages should be effectively communicated.

Theatre of the oppressed and entertainment-education (Edutainment) as the theoretical framework for the Study

The theatre of the oppressed and the theoretical concept of entertainment–education (edutainment) were used as the conceptual framework for the study. Entertainment education, defined as the intentional placement of educational content in entertainment messages (Singhal and Rogers, 2002). Entertainment-education (edutainment) projects combine entertainment and education to increase knowledge, shift attitudes, and promote social change using a range of communication platforms, including theatre (Riley et.al., 2017). Participatory communication is one of the communication strategies that can be used in behavioral changes.

With the participation of the audience as roles of the drama, the effectiveness of the communication can be improved. The participatory theatre is an example of this type of drama. The Brazilian dramatist Augusto Boal invented this participatory drama format known as the “Theatre of the oppressed” and it shows very successful results in the fields of social conflict resolution, gender issues in society, health and sexual educational programs (Boal, 2008). This type of drama is also known as alternative drama. In this form of drama, the participants are allowed to become actors on the stage, replacing the characters they wish to change, and they can create positive solutions to the problem discussed in the drama. Boal challenges the practice of the use of the theatre as a tool for social control and suggests a new way of conceptualizing theatre, its function, and its forms (Durden and Nduhura, 2003). The forum theater focus is both educational and per formative (Sullivan & Lloyd, 2006). The Sri Lanka Development Journalist Forum has highlighted 4 key points and 4 steps in conducting a forum theatre in their forum theatre learning manual based on the theatre work of Augusto Boal, the inventor of the forum theatre. The forum theatre for the present study was developed based on those key points and implemented according to the 4 steps given below.

Table 1: Key points of the forum theatre

	1.	2.	3.	4.
Key Points	Forum theatre is a short play that revolves around central characters. The story can be about oppression and social conflict.	It triggers the audience to think about taking action to help the protagonist to overcome the sense of powerlessness and to resolve conflict.	The play is moderated by a facilitator who is the bridge between the audience and the actors, and traditionally, the facilitator is known as the ‘joker’.	The play is re-enacted by the spect-actors with solutions they think would benefit the central character so that he/she is empowered to change her/his deprivation of power with realistic alternatives

Source: Youth shaping perspectives, forum theatre learning manual (Sri Lanka Development Journalists Forum (SDJF), (2018)

There are four steps in conducting forum theatre (Forum theatre learning manual, Sri Lanka Development Journalists Forum, 2018). These steps include i. Introduction: The facilitator presents the expectation and purpose of the performance. ii. First play: first, the play is performed as a conventional theatre of approximately 10- 30 minutes. iii. Repeat the same drama: The facilitator gives clear instructions on how the audience can get involved. iv. Interventions: The public can change all the characters as they deem fit according to their comprehension of suitable solutions for the issue.

Forum theatre as a method of participatory and edutainment theatre for health and science communication

Research literature has proven the success of the use of art-based tools and methods for science communication in different contexts, and it is an emerging trend in science communication. Edutainment is the use of entertainment for educational purposes. A study conducted by McGillion, & McKinnon, 2014 to provide information on improved seed varieties and appropriate agronomic practices to maximize their yield among rural communities highlights the potential for entertainment-education forum theatre to provide effective agricultural science messages. Evidence can be found for the use of forum theatre for communicating health-related messages. Durden & Nduhura, 2003 concluded that forum theatre is an appropriate participatory methodology for investigating issues around HIV and AIDS.

In India, the forum theatre experiences show an increase in awareness of the development issues among civilians, and it implies that the theatre can’t change the whole system, but it can increase the awareness and the critical evaluation of the issues (Mills, 2009). Critical evaluation of the problem is important in mitigating CKDu issues since the problem is complex and multifaceted. However, the research evidence for

the effective use of the forum theatre to discuss agriculture and environment-related issues is insufficient. Also, the forum theatre has applied mostly to the young groups but not to adults. On the other hand, one of the basic features of the forum theatre is identifying the character/s of the oppression. However, there is no identified character of oppression in the context of CKDu, especially at a time of causative agents/factors have not been identified. There is no evidence on the use of forum theatre for CKDu, like multidimensional problems with environmental, health, occupational, and socio-economic characteristics. Therefore, the overall objective of this study was to evaluate the effectiveness of this relatively new form of theater (forum theatre) as a method of participatory and edutainment theatre to sensitize the farming community and school children on chronic kidney disease of unknown (CKDu) and mitigation methods.

Objectives

The study was designed in two phases. The objectives of the phase i were to identify the basic demography of the affected and vulnerable communities, present level of awareness, knowledge and attitude of the community and school children on CKDu, present practices of the community which may be the causal factors of CKDu and to identify the knowledge, awareness and attitudinal gap. Phase ii of the research study was aimed to develop the messages and message treatment dimensions for the drama and to develop an appropriate forum theatre skit to communicate the identified messages based on the results of the phase i and to evaluate the effectiveness of the forum theatre as a new participatory and edutainment theatre to mitigate CKDu issues.

MATERIALS AND METHODS

Social survey to understand the Knowledge, Attitude, and Practices (KAP) and the basic demography of the communities

The CKD/CKDu patients, non-patients, and school children were interviewed as the respondents of the survey using a semi-structured questionnaire. The questions were developed based on the secondary data on CKDu and the discussions with medical doctors, especially to include the symptoms of the disease and possible causative factors to understand the knowledge, practices, and attitudes related to CKDu. The questionnaire was mainly structured under the sections of demographic information, knowledge of the disease, symptoms, possible causes, practices, and attitudes on CKDu. Knowledge was measured by providing statements related to the basic understanding of the disease, diagnosis, control, and causative factors. Responses to the question options were given as 'correct', 'incorrect', and 'not known'. Attitudes were measured by the five-point Likert scale for the given attitudinal statements.

School children from Grade 10 -13 were randomly selected from 4 schools in the North Central Province of Sri Lanka. About 50 students from each school were selected as the respondents. Non-patients (200) from the community were selected from 5 randomly selected villages in the Medawachchiya (50) and Padaviya (50) MOH areas as the high prevalence of the disease and Galnewa (50) and Palagala (50) as the emerging areas of the disease. Patients (100) were selected (every second person in the waiting queue) from two specially established renal treatment clinics in Medawachchiya (50) and Padaviya (50). Ethical clearance for the study was obtained from the Faculty of Medicine, University of Peradeniya, Sri Lanka, before conducting the study. Informed consent was obtained from the respondents before the data collection.

Development of the forum theatre drama

In most forum theatre programmes, the drama script has been developed based on the research results and in-depth engagement with the target audience. Hence, the drama of the present study was developed based on the survey results, secondary data, and discussions with the health professionals. The story /plot of the drama was developed to attract the audience while creating opportunities for the audience to become spect-actors (engage in forum theatre). The drama was pre-tested with drama and communication professionals, and improvements were made.

The messages to be communicated through the drama were identified based on the results of the social survey. Moreover, key informant discussions were conducted with health professionals (medical doctors), and the secondary data were used to identify the messages. Accordingly, the possible causative factors, especially fluoride in drinking water in combination with water hardness, overuse and misuse of agrochemicals, symptoms of the disease, myths about the disease, and the need for receiving scientific knowledge on the issue, were highlighted as the main intended messages to communicate through the drama. A drama script was developed based on the principles of forum theatre and edutainment, and it was rehearsed and pre-tested with experts for development. A senior Lecturer from the Faculty of Arts, University of Peradeniya, who has experience in forum theatre, as well as another popular scriptwriter and a theatre director in Sri Lanka, gave their expertise in developing the drama. An experienced young group of volunteers was recruited as the drama group. Then, seven forum theatre programmes (four school programmes and three community programmes) were performed to investigate the effectiveness of forum theatre as a method of participatory communication to sensitize the farming community and school children on CKDu and mitigation methods.

Synopsis of the drama

The narrative centres around a rural farming family, comprising a father, a mother, a son, and a daughter. The children are currently enrolled in school, while the mother assumes the role of a housewife. Farming serves as the principal source of income for the family, which employs conventional farming methods characterised by a substantial reliance on agrochemical inputs. The opening scene of the drama features the farmer expressing concerns regarding the symptoms of CKDu, although he does not recognise these symptoms as such. The son urges his father to seek medical attention, yet the father dismisses this suggestion.

Additionally, a neighboring woman, who is set to participate in a mobile community programme addressing CKDu, invites the farming family to engage in this initiative, but they decline her offer. A boutique owner in the village emerges as another significant character in the drama. The farmer visits the boutique and acquires a banned agrochemical, which is available on the black market at an exorbitant price. This transaction occurs on a loan basis, and the low socioeconomic status of the farming family is also depicted. The woman who is involved in the CKDu community mobile programme returns to the boutique and shares health messages regarding CKDu with the boutique owner and the farmer. Her character is used to convey the symptoms of the CKDu, the need for early diagnosis, and the methods of diagnosis. Moreover, the recommended daily intake of water and prevailing myths about the disease are discussed. However, the boutique owner and the farmer engage in a dispute that leads them to disregard these important messages.

The daughter of the farming family shares her knowledge about the potential causative factors for CKDu, as informed by the school programme. The farmer's wife utilises low-quality aluminum utensils for cooking and does not use purified water (treated to reduce the hardness) for her culinary needs. Accordingly, she explains the need of the use purified water, and refraining from the use of low-quality aluminum utensils for cooking. The daughter requests her mother to refrain from using these substandard utensils and to adopt treated water for cooking, drawing upon the knowledge she has acquired at school. Nevertheless, the mother is resistant to this advice.

The farmer, with the assistance of his son, misuses agrochemicals in the fields. He ultimately falls ill and collapses while working. The subsequent scene reveals the father's demise, leaving the family to confront numerous socioeconomic challenges. The drama concludes with the mother and daughter in tears, as the son decides to abandon his education to engage in economic activities related to farming which his father was engaged in before his demise. A melancholic song plays in the background, accentuating the poignant and distressing nature of this scene.

The drama also features a facilitator whose role is to keep the audience alive through various activities and games, thereby simulate the participation of the audience as spect-actors, who join the performance as actors or actresses.

Data analysis of the social survey and the evaluation of forum theatre

The data from the social survey were analysed descriptively to investigate the fundamental demographic information, status, and the knowledge, attitudes, and practices related to CKDu. The responses were recorded and analysed the percentages to assess the knowledge level. Eight forum theatre programmes were conducted across four selected schools and four village communities in the designated areas of Medawachchiya, Padaviya, Galnewa, and Palagala within the Anuradhapura district of Sri Lanka. Approximately 200 students were randomly selected as the study sample, with 50 students from each school, out of a total of 1,000 students who attended the drama. Conversely, all community members (181) participated in the four forum theatre programmes. Analyses for the student sample and community participants were conducted separately. A Paired T-test was used for the before-and-after analysis to evaluate the effectiveness of the drama regarding immediate knowledge and attitude changes. Furthermore, the forum theatre programme was recorded on video and photographed, for qualitative analysis of the audience's attention and participation as spect-actors. A structured questionnaire was employed to measure effectiveness in terms of knowledge and attitude changes. Students were randomly selected, while all participants from the community plays were included in the community evaluation. Additionally, the drama was video recorded and photographed for meticulous analysis to assess effectiveness concerning audience attention, reactions, retention, and participation as spect-actors, who are those actively engaged in forum theatre as community actors and actresses.

RESULTS AND DISCUSSION

Results of the social survey to understand Knowledge, Attitude and Practices (KAP study)

The social survey was conducted in the Anuradhapura district of the North Central province of Sri Lanka as it is one of the high prevalence regions of the chronic kidney disease of uncertain etiology (CKDu). In the district, the highest number of patients were reported to be from Medawachchiya and Padaviya Medical Officer of Health (MOH) areas and Palagala and Galnewa MOH areas were identified as the emerging areas of the disease. Table 2 shows the demographic characteristics (age, gender, occupation) of the respondents.

According to the Table 2, 51% of the patients were male and the rest (49%) were females. The majority (76%) of the respondent patients were in the age category of 50-70 years.

The results revealed that 67% of the respondents studied up to General Certificate of Education (GCE A/L; up to year 13 in school). When considering the occupation of the patients, the majority (80%) engaged in farming. Moreover, 53% of the respondents employed farming when considering the non-patient community group. Accordingly, farming is the main occupation of most of the patients as reported by Wijewickrama et.al. (2019) and Ranasinghe et.al., (2019). About 30% were government workers and most of them served in forces and the police department. About 94% of the respondents had their own land and only 4% and 2% had leased land and encroached land respectively.

Table 2: Demographic characteristics of the respondents

Demographic Characteristic	Patients	Non-patients (Community)	Non-patients (Students)
Age			
>20	3%	15%	
20–30	5%	26%	
31–40	12%	23%	
41–50	39%	23%	
51–60	37%	10%	
61–70	4%	3%	

<70	-	-	100%
Gender			
Male	51%	50%	35%
Female	49%	50%	65%
Occupation			
Farming	80%	53%	-
Government	11%	30%	-
Private	6%	4%	-
Not any and other	3%	14%	-

Knowledge and awareness of the respondents on CKDu

Knowledge of the respondents on CKDu and related factors were measured under four different areas as the general knowledge on the functions of kidney and the disease, diagnosis and treatments, symptoms of the disease and perceived knowledge on causative factors for CKDu. Responses were marked as 'correct', 'incorrect' and 'don't know'.

Knowledge and awareness on the general functions of kidney and CKDu

Eight statements were given based on general knowledge of kidney functions and disease. The percentage of the correct responses given by the participants (students, patients and non-patients) of the survey for different statements to measure the knowledge and awareness is given in Table 3.

Table 3: Percentage of the correct responses given by the participants (students, patients and non- patients)

Statement	% of Correct response by the students	% of Correct response by the patients	% of Correct response by the non-patients
Main function of the kidney is to cleanse the blood of toxins and transform the waste into urine	76%	64%	69%
Chronic kidney disease (CKD) is a long-term condition where the kidneys don't work as well as they should	72%	60%	75%
There are two types of CKD based on the identification of causes as identified (general) and absence of identified causes as CKDu (unknown etiology)	32%	34%	35%
Diabetic is a causative factor for identified (general) CKD	27%	57%	56%
High blood pressure is a causative factor for identified (general) CKD	23%	66%	54%
Most people live normal, healthy lives with one kidney	55%	69%	76%
Three liters (6 glasses) of water should drink daily for a healthy life	72%	66%	76%
Dark yellow colour in urine indicates the inadequate consumption of water	64%	76%	66%
CKD is not a genetic disease	86%	53%	82%

According to the Table 3, low percentage of the students (32%), patients (34%), and non-patients (35%) were aware that there are two types of CKD based on the identification of causes as identified (general) and absence of identified causes as CKDu (un known etiology). In addition, 47% of the patients believe that the disease is genetically transferred although there is no such direct relationship. Moreover, only 66% of the patients were knowledgeable on the amount of daily intake of water for a healthy life of a normal person depicting the need for awareness raising on these factors. However, all were not adequately knowledgeable that dark yellow colour of the urine is an indicator of inadequate consumption of water depicting the need for awareness.

Therefore, knowledge and awareness of the community with especial reference to diagnosis and treatment of the disease were investigated as shown in Table 4.

Table 4: Knowledge and awareness on diagnosis and treatment of CKD

Statement	% of Correct response by the students	% of Correct response by the patients	% of Correct response by the non-patients
The disease can be diagnosed by an urine and blood test	91%	97%	82%
The disease can be controlled through clinical treatments	75%	86%	80%
Dialysis is a treatment method for CKD	45%	80%	69%
Home dialysis is possible	14%	20%	21%
There is a possibility to transplant a kidney to control the disease	79%	93%	40%
CKD can be cured by treatments	46%	72%	63%

As shown in Table 4, majority of the respondents in the community (students 91% patients 97% non-patients 82%) were aware about the initial identification of the disease through urine and blood tests. However, only 45% of the student respondents and 69% of the non-patients were aware about dialysis treatment method. Moreover, they were less aware that the home dialysis is possible. Also, only 40% of the non-patients were identified the kidney transplant as a possible treatment option for the disease. Knowledge of the patients on the diagnosis and treatment of the disease was at a high level in general obviously due to their exposure and experience. However, they also were not much aware about the possibility of home dialysis as a treatment option. It is important to raise the awareness of the community on diagnosis and treatment of the disease to mitigate the issue.

Knowledge and awareness of the symptoms of CKDu

Identification of symptoms by the community is important in mitigating CKDu. Bone/joint pain is the most reported symptom, followed by loss of appetite, lack of energy, muscle cramps, and difficulty in keeping legs still according to an individual analysis of the symptoms revealed for CKDu (Abeywickrama et.al., 2020). Figure 1 shows the percentage of respondents who were correctly identified with the common symptoms of CKD. According to the Figure 1, the patients were generally more aware about the symptoms than students and non-patient group. That is due to their own experience and knowledge and awareness gained during the treatments. All respondents recognized tiredness (students 80%, patients 95%, and non-patients 76%) as a symptom of CKD. However, the students and non-patients were not much aware about most of the other symptoms. Early identification of the symptoms of CKD is very important in treatment of

diseases. Therefore, awareness levels in communities and schools should be heightened to ensure early identification.

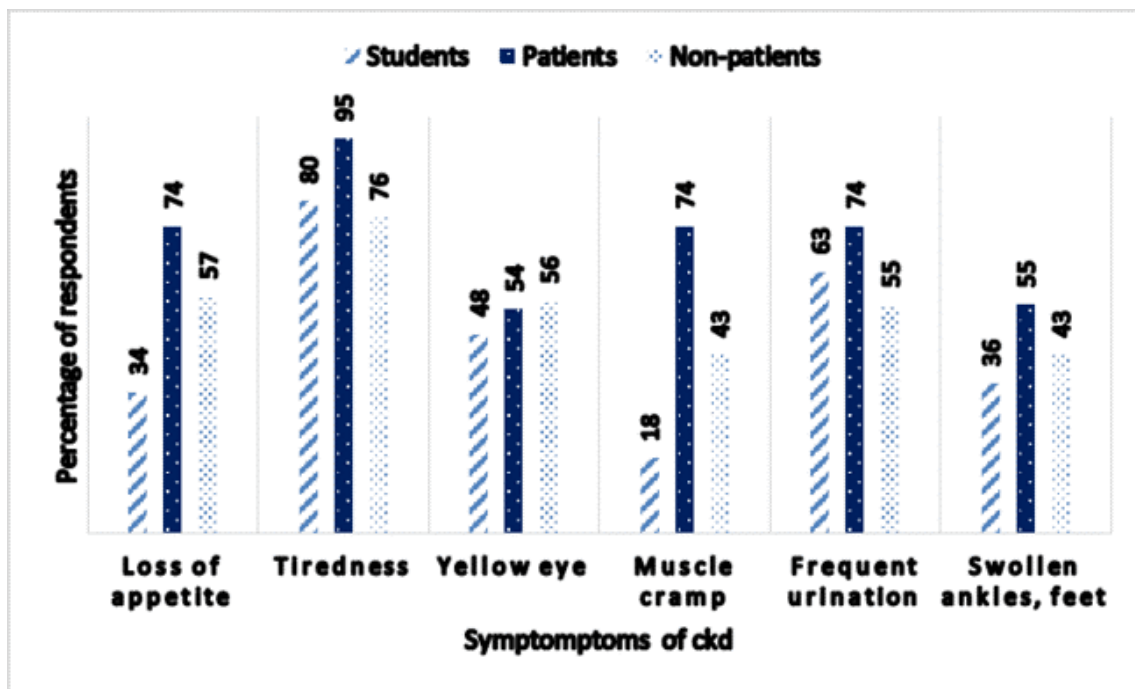


Figure 1: Percentage of respondents identified the common symptoms of CKD correctly

Perceived knowledge on causative factors of CKDu

Causative factors of CKDu emerged severely in the North Central Province of Sri Lanka in recent time is not yet been clearly understood hence, controversial. However, it is important to consider those factors in mitigating the problem at different levels at different contexts until they are investigated clearly. Therefore, the causative factors as perceived by the community was investigated as shown in Figure 2.

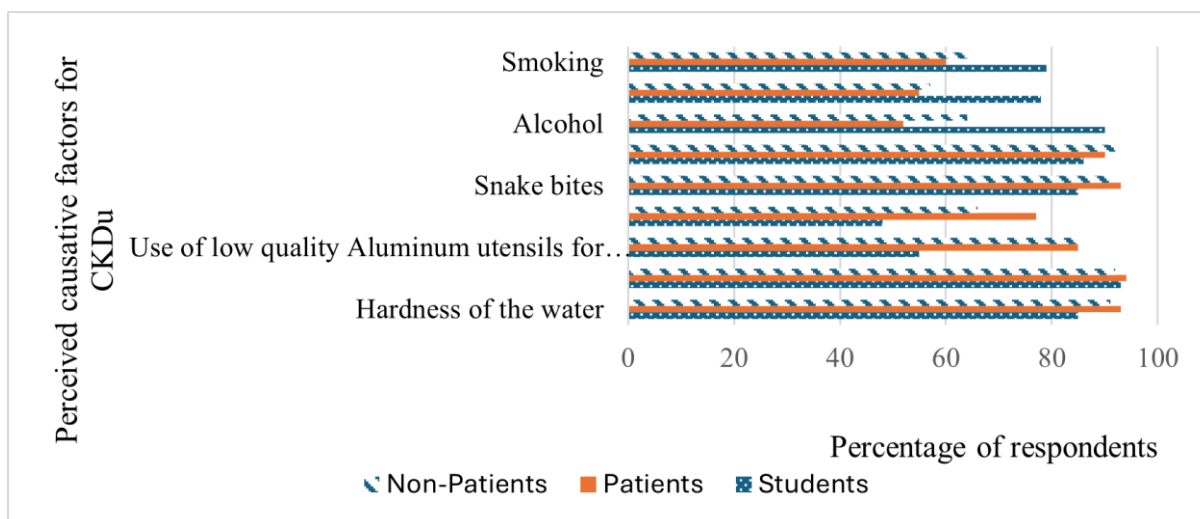


Figure 2: causative factors as perceived by the community

According to Figure 2, the majority of all three categories of respondents were aware of the suggested causative factors. It is a positive fact that most of the respondents (more than 90%) were aware that the hardness of water and not drinking adequate amount of water is a causative factor for CKDu. However, identification of the use of ayurvedic medicine and low-quality aluminum utensils as causative factors by students were low compared to adults.

According to Table 5, majority of the respondents (88%) perceived that CKDu is a serious health issue in the North Central Province of Sri Lanka. Moreover, 60% of the respondents' attitude is that the disease is a severe socio-economic problem in the province. Majority of the respondents (89%) attitude is that they have a personal responsibility in mitigating the issue is a positive fact. Nearly half of the respondents (52%) believe that the government support in mitigating the issue is not adequate while 24% is agreeing that the government support is adequate. More importantly, attitude of the 90% of respondents was that the knowledge and awareness raising on the issue is important in mitigating the issue. In addition, many of the respondents (85%) perceived that it is needed to minimize the usage of agrochemicals. However, the results revealed that the banned weedicide (Glyphosate) in 2015, is still available in the market. The availability of weedicides in the market needs to be handled seriously and actions taken to ensure outright stoppage in the use of the agrochemical.

Table 5: attitude of the community on CKDu

Attitudinal Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
CKDu has become a serious health issue in the North Central Province of Sri Lanka	60%	28%	2%	8%	2%
CKDu has become a severe socio-economic problem in the North Central Province of Sri Lanka	21%	39%	28%	9%	3%
I have a personal responsibility in mitigating CKDu	45%	44%	5%	4%	2%
Government support to mitigate CKDu is not adequate	20%	32%	21%	18%	6%
Knowledge and awareness raising on the issue is important	43%	47%	6%	2%	1%
Need to minimize the agro-chemical usage in agriculture	39%	46%	5%	8%	2%
The banned agro-chemical (Glyphosate) is still available at the market illegally	22%	30%	20%	14%	12%

Practices of the respondents related to CKDu

Different practices of the community considered as relational to the disease were investigated. Drinking adequate amount of water is important for the smooth functioning of the kidney and health in general. Daily water intake of 3.7 L for adult men and 2.7 L for adult women meets the needs of most persons (Michael et.al 2005). However, in the present study, only 60% of the community members met the daily requirement of water. Moreover, water quality is a matter for CKDu. Fluoride contained in drinking water in combination with water hardness is one of the suspicious factors for CKDu (Wasana et.al. 2016, Balasooriya et.al 2020). One of the recommendations for mitigation is to drink filtered water through reverse osmosis purification. Majority of the community members (78%) were used filtered water for drinking purposes. However, only 51% used the same water for cooking purposes. The main reason was the unwillingness of the people to pay for treated water. Moreover, some of the respondents had to travel long distances to buy treated water. Furthermore, some respondents believed that it is adequate to use filtered water for drinking, not essentially for cooking purposes. These results show the need for increased availability of treated water and the welfare of the community. Furthermore, it is needed to sensitize people to use filtered water not only for drinking but also for cooking purposes.

The use of herbal medicine (arishta) is one of the suspicious factors for CKDu as identified by some researchers (Jayatilake et.al. 2013). According to Jayatilake et.al. (2013) and Sing et.al (2020), chronic exposure of people in the endemic area to low levels of cadmium through the food chain and to pesticides is also a suspicious factor for CKDu. Therefore, the practices related to agrochemical application was investigated (Table 6).

Table 6: Practices related to agrochemical application

Practice	Always	Sometimes	Never
Wearing a protective cover/dress when applying agrochemicals	6%	20%	74%
Smoking and/or chewing beetle while agrochemical application	4%	6%	90%
Food intake while applying agrochemical	0%	4%	96%
Having a bath after agrochemical application	94%	6%	0%
Mouth sucking of the nozzle of the sprayer	8%	15%	76%
Over dosage of agrochemicals			

According to the results (Table 6), the main issues with agrochemical applications were not wearing a recommended protective cover/dress and over dosage of agrochemicals. Therefore, those are the main issues which should be addressed. Not wearing a recommended protective cover was mainly due to the inconvenience especially with the hot environment in the dry zone. Over dosage of agrochemical was expecting a quick result with higher efficiency neglecting the positive attitude toward nature and environmental health.

Perceived adequacy of the knowledge

The adequacy of the present level of knowledge of the respondents was investigated to see whether they need further knowledge and awareness on CKDu. Figure 3 shows the adequacy of the knowledge and awareness on CKDu as perceived by the respondents.

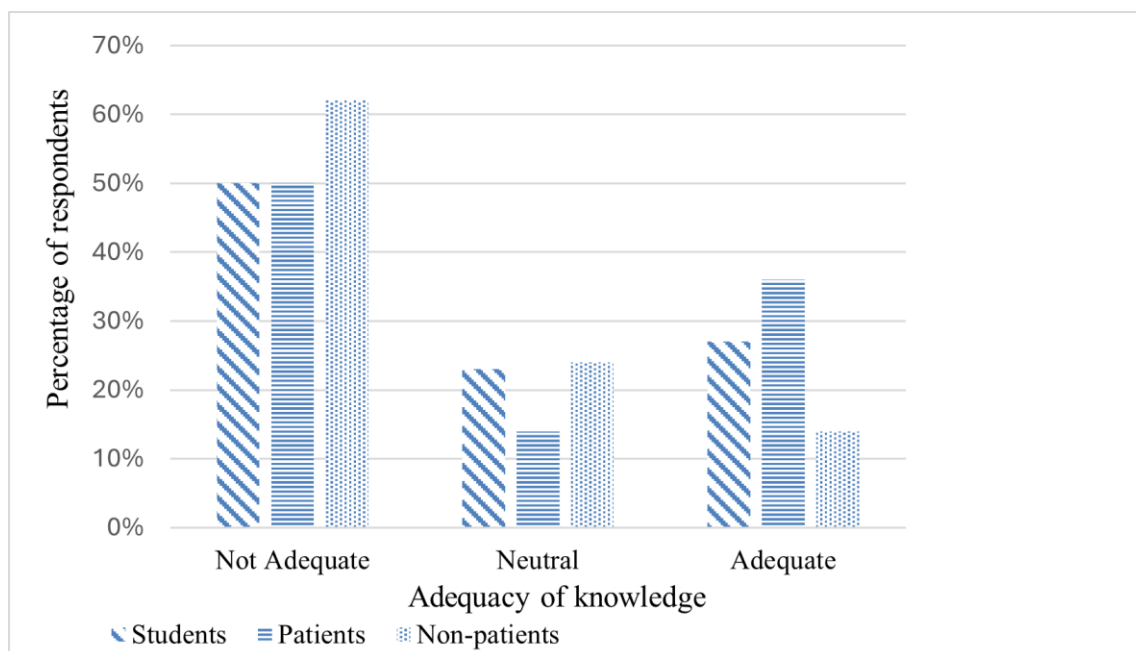


Figure 3: Adequacy of the knowledge and awareness on CKDu as perceived by the respondents

According to Figure 3, half of the students and patients and 62% of the non-patients stated that their level of knowledge on CKDu is not adequate whereas a considerable percentage of respondents of students (23%) and non-patients (24%) were neutral to the question. Therefore, it is needed to take measures to make aware and knowledgeable the community on the issue.

Evaluation of the effectiveness of the forum theatre for student audience

The effectiveness of the drama in communicating intended messages were investigated based on the selective messages such as causative factors, symptoms of the disease, diagnosis, the required level of water

consumption, whether it is a genetically transmitted disease and the attitudes. Moreover, the drama was assessed by direct questions about the effectiveness.

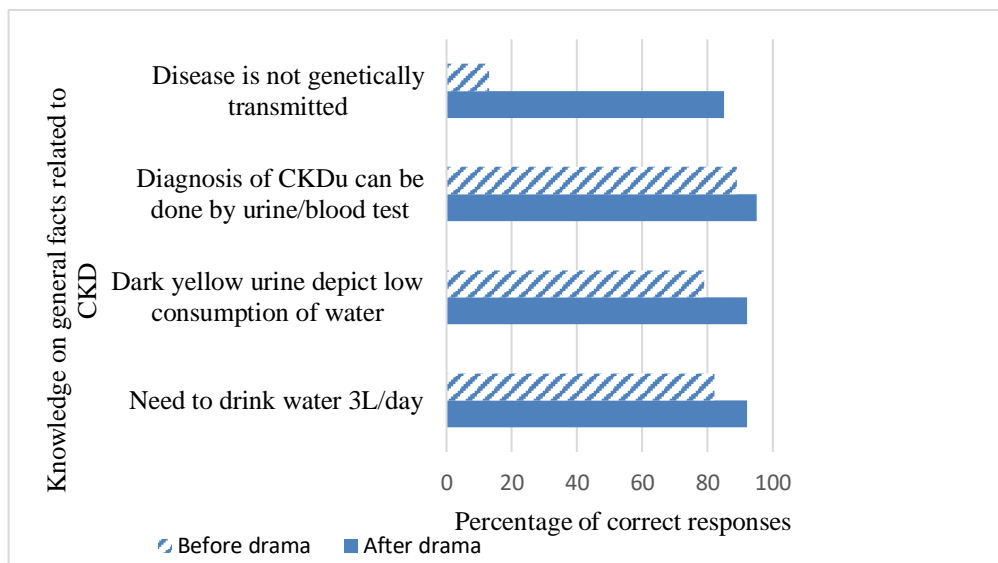


Figure 4: knowledge of the general facts of the respondents before and after performance of the drama

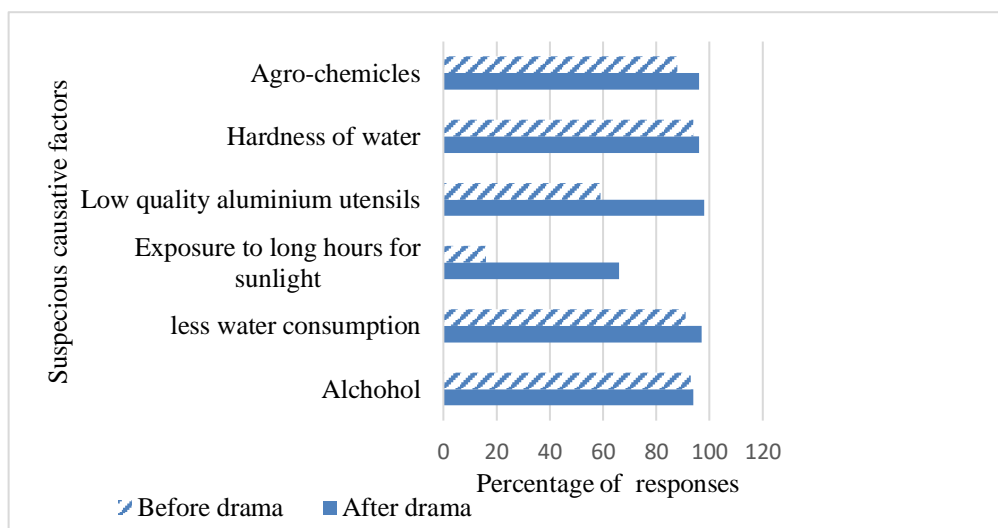


Figure 5: Responses of the students for causative factors before and after showing the drama.

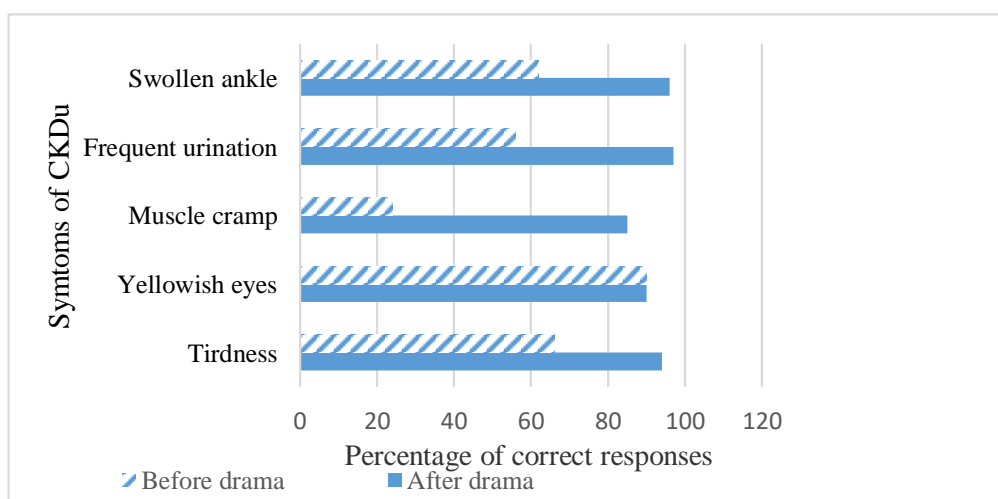


Figure 6: knowledge of the respondents on symptoms of CKDu before and after performance of the drama

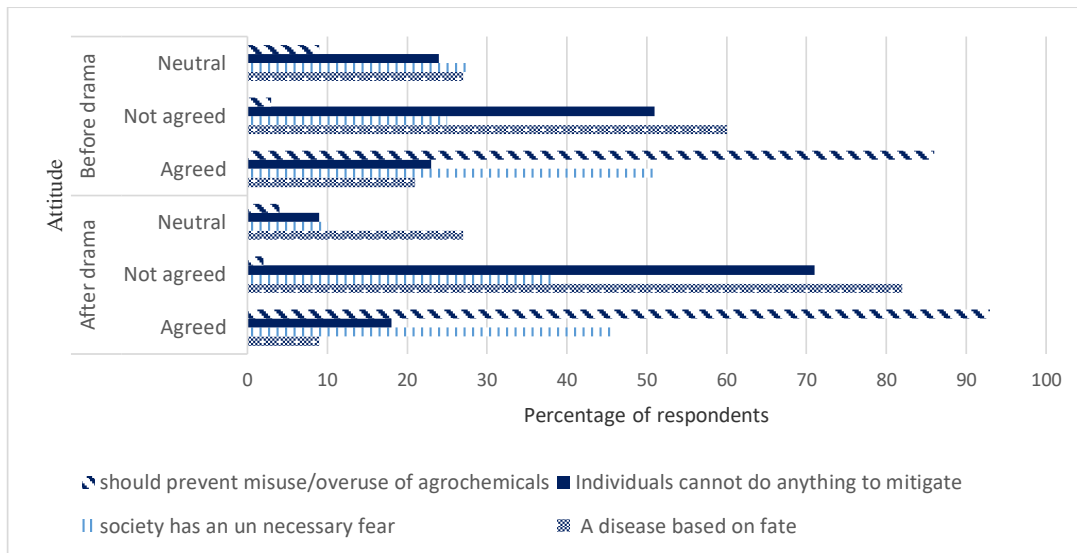


Figure 7: knowledge of general facts of the respondents before and after performance of the drama

Effectiveness of the Forum Theatre for the Community Audience

Four community performances were conducted namely in Medawachchiya, Galnewa and Palagala. All the participants were considered for the analysis (N=181). Table 10 shows the knowledge of the respondents on general facts related to CKD, before and after performance of the drama.

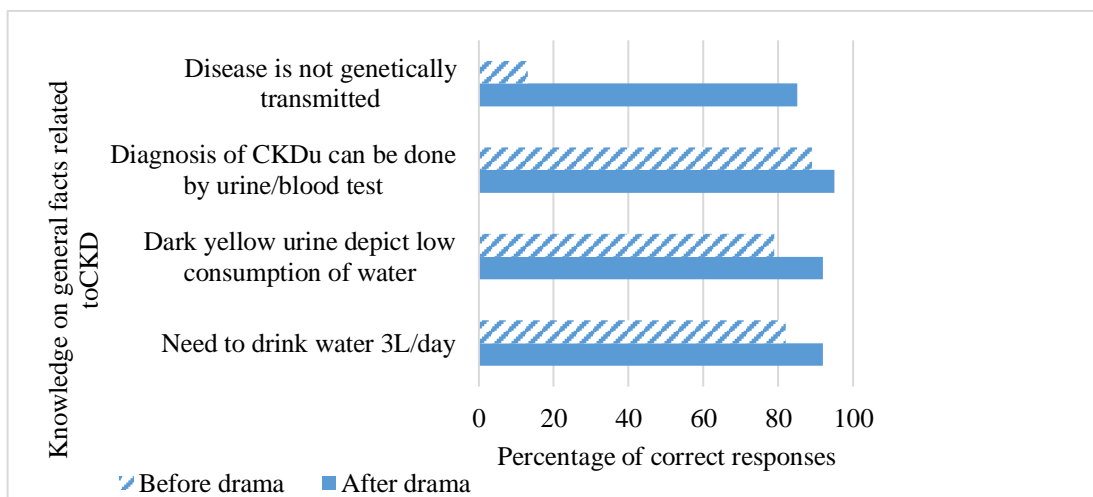


Figure 8: knowledge of the respondents on general facts related to CKDu, before and after the performance of the drama

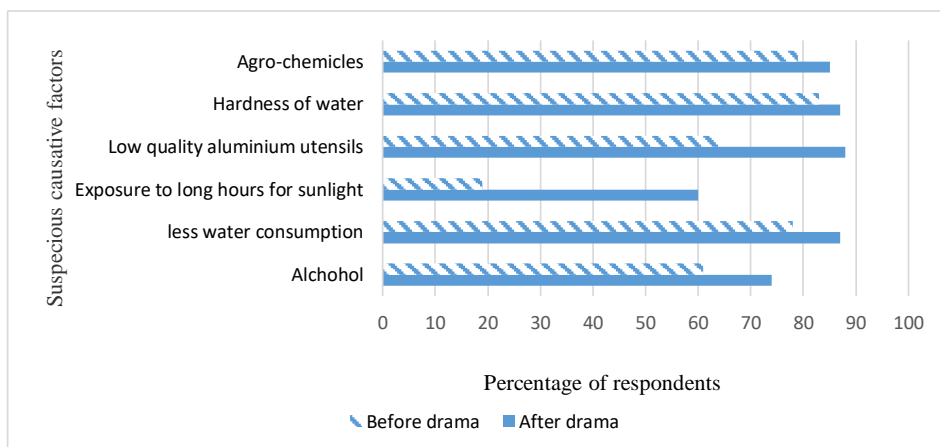


Figure 9: Responses of the community participants for causative factors before and after showing the drama

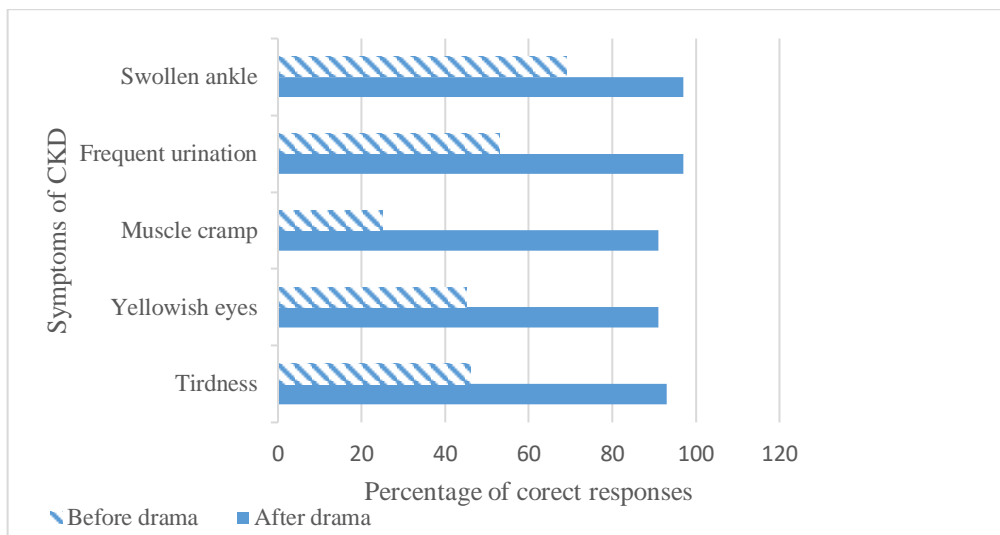


Figure 10: knowledge of the respondents on symptoms of CKD before and after performance of the drama

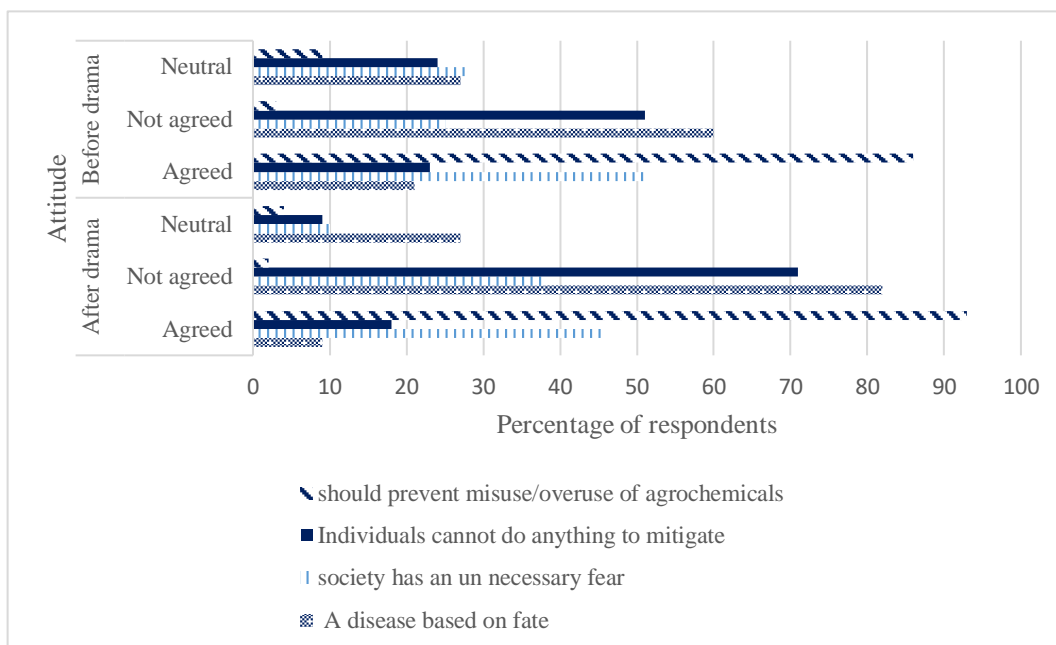


Figure 11: Attitude of the respondents related to CKDu

Knowledge and Attitude Change of Students and the Community Before and After Showing the Drama

Both students and community respondents' immediate overall knowledge and attitude changes before and after the forum theater performance were compared using the paired-samples t-test. As a result, at the 95 percent significance level there was a significant difference in the student's overall knowledge and attitude following the performance of the drama ($t=20.406$ $p=0.000$ and $t=19.206$ $p=0.000$ respectively). Following the performance of the drama there was also a significant difference in the community's general attitude ($t=4.194$ $p=0.000$) and general knowledge ($t=17.731$ $p=0.000$). These findings demonstrated the forum theatres effectiveness as an interactive and educational medium for transferring messages about agriculture and health.

Video and Photograph Analysis/observations

Forum theatre programmes were video recorded, photographed, and observed to understand the attention and participation of the audience as spect-actors. In all recordings/photographs of the performance, it was

observed that the drama was able to maintain the consistent attention of the audience throughout the drama. Similarly, the results of the study conducted by McGillion and McKinnon, 2014 to communicate information on improved seed varieties and appropriate agronomic practices indicate that theatre performances are capable of both attracting and retaining large audiences. However, the facilitator played a significant role in maintaining the continuous attention of the audience and motivating the audience participation in the drama as spect-actors which was an essential factor for success.



Plate 1: Performance of the drama for the community audience by the drama group



Plate 2: Participation of a community participant (sitting in the middle) as a spect-actor



Plate 3: Shows the general attention for the drama by student participants



Plate 4: Shows the general attention for the drama by student participants



Plate 5 shows that the drama has humor and entertainment.



Plate 6 shows the community's attention for an emotional scene of the drama.



Plate 7: Participation of a student as a spect-actor

It was hypothesized that the community participation would be less as the spect-actors in the drama compared to the student participants. However, both students as well as the community members participated actively when the opportunity was given. Bucchi and Trench, 2021 have proposed an inclusive definition of science communication as the social conversation around science. Participatory theatre provides an opportunity for community members to share stories of personal growth (Riley et.al. 2017). The forum theatre used in the present study was able to communicate health and agricultural science messages to the selected rural community as an edutainment participatory theater.

CONCLUSIONS

There was a knowledge and attitudinal gap in the students as well as in the community on CKD/CKDu and mitigatory measures. Failing to wear the necessary protective cover or garment and misuse were the main issues in agrochemical application. According to the descriptive and inferential statistical analysis, overall knowledge and attitudes of the participants were significantly improved after the performance of the drama. It was demonstrated via photographs, videos, and observation that the audience's interest and general attention were consistently maintained throughout the drama. Furthermore, the forum theatre was given a platform for students and communities for critical analysis on the issue while presenting practical solutions. It can be inferred that the forum theatre is an effective tool in communicating health and agricultural messages as a novel way of participatory science communication. Thus, this method can be recommended for communicating health and agricultural messages in similar contexts while allowing communities critical thinking and presenting their solutions to the related issues. However, it is recommended for researchers to further explore the potential and limitations to generalize the findings at different contexts and practitioners to carefully design the forum theater as an effective participatory and edutainment theatre for health and agricultural communication.

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