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Original Article

Awareness and practices of rabies and animal bite management among victims who attended the OPD services at Avissawella Base Hospital, Sri Lanka

Abeyrathna, K.K.T.P., Jawad, J., Subashini, H.P.N., Jayamaha A.R.*, Vithanarachchi, S.L.H

Department of Nursing, KIU, Koswatta, Battaramulla, Sri Lanka

Abstract

Animal bites are one of the major causes for morbidity and mortality worldwide. Rabies is life threatening viral disease transmitted through animal bites. Proper management of bite wound is essential in prevention of complications of animal bites. Objective of the study was to assess the awareness and practices regarding rabies and animal bite management among victims. Descriptive cross-sectional study was conducted among the randomly selected 187 victims of animal bites who attended the Avissawella Base Hospital. A pre-tested interviewer-administered structured questionnaire was used to collect data. Descriptive statistics and chi square test were used for data analysis and SPSS 23 was used as the statistical analysis tool. The age of the respondents ranged from 15 to 60 years of age. Among the participants 59% were male while the 41% were female. Among the victims,70.1% bites occurred due to dogs, 28.3% due to cats and 1.6% due to rats. Further, 95.7% of the victims had washed the wound site with soap and water and 90.4% had sought hospital treatment on the day of the bite. Only 17 (9.1%) of study participants knew the microorganism as cause of rabies. Knowledge was poor regarding other animals, that could transmit rabies and modes of transmission other than bites (39.8%). Moreover, excessive salivation was identified by 41.6% of the participants as a clinical manifestation of rabies in animals, while knowledge of other signs of affected animals such as altered personality (24.0%), fear to drink water (19.5%), fits (14.9%) were poor. The awareness and practices regarding rabies and animal bite management among animal bite victims were poor and awareness programs must be conducted for the public in order to prevent rabies and animal bites.

Keywords : Awareness, Practices, Rabies, Animal bite, Victims

Introduction

Animal bites are one of the major causes of morbidity and mortality worldwide (Baxter, 2012; Haupt,1999). Animal bites are defined as "an injury caused by the mouth and teeth of an animal resulting in direct tissue damage, deep anatomical structure disruption, introduction of infectious agents and envenomation" (BMJ Best Practice, 2016). Animal bites can result in serious injuries and exposure to many diseases caused by microorganisms and it is a major worldwide public health concern today as the number of cases are increasing (Abrahamian & Goldstein, 2011; Cantas & Suer, 2014). Rabies is transmitted through animal bites (Jackson, 2006). Further, it causes nearly ten thousand of deaths annually, mainly in Asia and Africa. Every year, more than 15 million people worldwide receive post exposure prophylaxis. This is estimated to prevent thousands of rabies deaths annually. Animal bites commonly from dogs, cats, bandicoots, mongoose, goats, rabbits, squirrels and many more. Among them, most common bites include dog and cat bites and dog bites are estimated to account for approximately ten million injuries annually. Dogs account for 76-94% of animal bite injuries while cat bites account for 2-50% of injuries related to animal-bites (WHO, 2017).

In Sri Lanka, 26 cases were detected in 2015 and 75% of them were due to dog bites. Rabies is a fatal zoonotic, viral disease caused by Lyssa virus which is 100% preventable through vaccinations of pet animals and proper post exposure therapy. The virus is transmitted through bites, licks on abraded skin or intact mucosa by infected animals (Fernando, Mallikahewa, & Gunasekara, 2015).

Management of bite wound is essential in the prevention of complications of animal bites. Extensive washing and flushing of the wound for a minimum of 15 minutes with soap and water, detergent, povidone iodine or other substances that kill rabies virus,. followed by a course of effective rabies vaccine which meets the WHO standards and administration of Rabies Immunoglobulin (RIG) has to be initiated immediately after exposure (WHO, 2017).

Lack of public awareness towards animal bites is a major problem in prevention and control of the rabies. Knowledge regarding causative agent, mode of transmission, first aid for bite wound, post exposure treatment and other rabies preventable measures are essential for development and enhancement of strategies to prevent and manage animal bites and Rabies (Aga, Hurisa, & Urga, 2016). Objective of the study was to assess the awareness and practices regarding Rabies and animal bite management among victims.

Methodology

Descriptive cross-sectional study was conducted among randomly selected 187 victims of animal bites who attended the OPD services of Avissawella Base Hospital. Ethical approval was obtained from the ethics review committee of KIU and permission was obtained from the director of the Avissawella Base Hospital. A pre-tested interviewer administered structured questionnaire was used to collect data. The questionnaire consisted of 3 sections which was designed to obtain demographic data of the participants, knowledge and practices regarding animal bites. Further, the questionnaire was pretested with 10 animal bite victims who were not included in the main study sample. Descriptive statistics and chi square test were used for data analysis and SPSS 23 was used as the statistical analysis tool.

Results and Discussion

A total of 187 animal bite victims were enrolled in this research. Age, gender, educational level and employment status of the participants were assessed as the demographic characteristics. The participants belonged to 15 to 60 years of age.

Table 1. Demographic characteristics of the participants (n = 187)

Demographic characteristics	Frequency	Percentage
Gender		
Male	112	60
Female	75	40
Age in years		
>25	46	24.6
26 - 35	45	24.1
36 - 45	45	24.1
46<	51	27.2
Educational level		
Never been to school	104	55.6
Primary education	65	34.8
Secondary education	12	6.4
Tertiary education	6	3.2
Employment status		
Employed	98	52.4
Unemployed	89	47.6

Among the participants, 67.4% were pet owners and among them most victims (55.6%) had dogs as their pets. Among the 126 pet owners only 46% had vaccinated their pets.
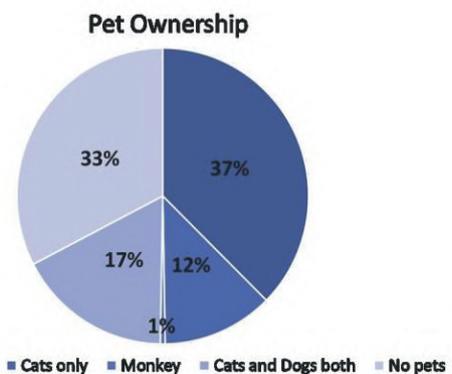

Fig. 1. Pet ownership of the participants. (n = 187)

Participants were assessed regarding awareness on cause for Rabies, mode of transmission, first aid for bite wound, post exposure treatment and other rabies preventive measures. Only 9.1% of study participants knew that a microorganism caused Rabies. Regarding the animal reservoirs of rabies, 98.4% of the participants had knowledge that dogs cause rabies, meanwhile other reservoirs of rabies were not correctly identified by the majority of the participants. Knowledge was poor regarding other animals that could transmit rabies and modes of transmission other than bites (figure 02, 03). Further, excessive salivation was identified by majority (81.6%) as a clinical manifestation of rabies in animals, while knowledge of other signs (Altered behaviours 24.0%, Hydrophobia -19.5%, Seizures-14.9%) were poor. Majority of the participants (89.3%) had proper knowledge on how to initialize the first aid treatment for an animal bite which is washing the wound with soap and water, and 95.2% of respondents knew that vaccination of the animals is one of the important precautions to be taken to prevent rabies. Regarding the high risk sites, among the 187 respondents 59.7%, 50%, 34.4%, 19% identified head, genitalia, Face and neck respectively.
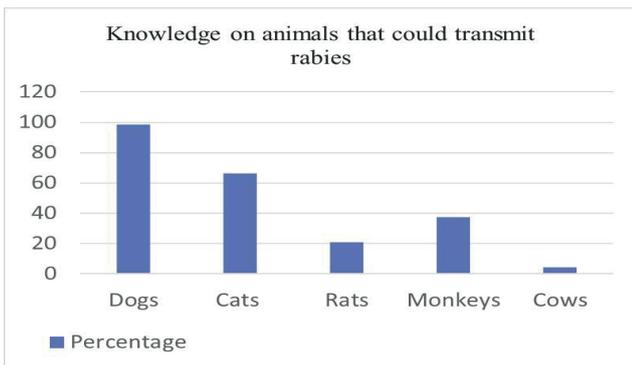
Fig. 2. Types of animals that could transmit rabies (n = 187)
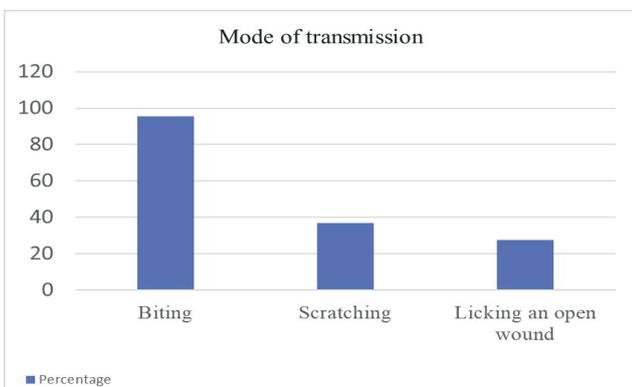
Fig. 3. Mode of transmission Rabies (n = 187)

Attitudes of the participants regarding rabies prevention were assessed using five questions. As stated in table 02 majority had good attitudes regarding vaccination and stray dogs elimination to prevent rabies.

Table 2. Attitudes regarding rabies and animal bites

Questions	Yes	No
Rabies can be prevented	83.4%	16.6%
Vaccination against rabies could prevent rabies	89.8%	10.2%
Rabies elimination is important	93%	7%
Vaccination can prevent developing rabies if a person is bitten by a rabid dog	63.4%	36.4%
Elimination of stray dogs can reduce the transmission of rabies in communities	72.2%	27.8%

The study revealed that the awareness regarding rabies and animal bite management were poor among victims. Similar research done by Muthunuwan, et al., 2017 found that only 6.9% (n = 275) of study participants knew dog as the only animal reservoirs of the rabies. Possible reason could be due to the fact that most anti rabies campaigns were aimed to control community dog population, dog vaccination, dog bite management. The study revealed that among 126 pet owners only 46% had vaccinated their pets. Similar study done in Eastern India found that among the animal bite victims, 97.9% (n =119) were due to their own animals. Most of the pet owners had not vaccinated their pets. Most attacks were encountered to upper limb (47.1%), lower limb (42.2%), chest (6.4%), face (4.3%) respectively (Chaudhuri, 2015). Some studies have found that the consecutive pet vaccination has a significant impact on reduction of rabies transmission (Nandi & Kumar, 2010; Seneschall & Luna-Farro, 2013; Day, Horzinek, Schultz, & Squires, 2016).

Conclusion

The study revealed that the awareness and practices regarding rabies and animal bite management were poor among animal bite victims. Awareness programs must be conducted on the animal reservoir of rabies, modes of transmission and initial management of the wound and rabies prevention in order to fill the gaps in knowledge regarding prevention of rabies and animal bites. Most of the animal bites were associated with dogs and cats. Majority of animal bite victims washed the wound with soap and had sought hospital treatment on the day of the bite. Majority of the victims were dog owners and other animals involved were pet cats and monkeys. Most of the pet owners had not vaccinated their pets and indirectly contributed to the spread of rabies. Pet monitoring regulations should be made more strict to emphasize pet vaccination.

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Original Article

A Literary study on 'Sri Lankan native woman' based on Leonard Woolf's colonial text 'The Village in the Jungle' through foremost philosophical thoughts

Amarasooriya D.N.P*

Department of English, KIU, Koswatta, Battaramulla, Sri Lanka

Abstract

'The Village in The Jungle' as a colonial writing, is elaborately fashioned to explore the naturally adapted yet irrationally socialized native sphere in order to portray the conventionally embedded organic whole within which diverse dichotomies exist that can be perceived as inextricably interconnected. Arising out of this intricate muddle of incompatible interrelations, the image of woman appears as a victimized docile body whose subaltern existence is repressed within the narrowed mythological theism, native cultural principles and socially attributed characteristics. Leonard Woolf as a colonial administrative officer endeavors to elaborately comprehend the unfathomable cosmos which intermingles itself with the obscured omnipotence of nature. With the imperial manipulation which excavates the roots of the native civilization and the repressive conventional taboos which force constraints on the certain social functions, how the feminine figure of the native culture was made to be a fragile hollow being, is encapsulated by Woolf through this narrative. In analyzing and elaborating the perspectives which are discussed within the research paper the theoretical perspectives of Simon de Beauvoir ('The second sex'), Sigmund Freud, ('Civilization and its Discontents',), Slavoj Zizek, ('Looking Awry'), Edward Said ('Culture and Imperialism') and Govind Kelkar and Dev Nathan (Gender Relations in Forest Societies in Asia) are referred with a thorough consideration. Thus, this literary study has focused on reflecting the social position and identity of the women in 'The Village in The Jungle', more explicitly their relationship with nature and further it has critically examined 'the portrayal of feminine figure' in relation to the varied social components which function as the manipulative social apparatuses within the novel while analyzing the narrator's point of view in illustrating the feminine figures in the novel 'The Village in the Jungle' as an observer in the outer sphere. Consequently, the study has excavated the buried feminine roots from the obscured native sphere and will make the muted voices of those subaltern bodies to be heard.

Keywords: Femininity, Native woman, Colonialism, Nature- Culture dichotomy, Patriarchy

Introduction

Leonard Woolf, the Village in the Jungle and the Native Woman

Leonard Woolf, during the period of 1904-1911 was engaged with the Ceylon civil service and appointed as the Assistant Government Agent of Hambanthota district from 1908 to 1911.His literary work constituted of novels, 'The Village in the Jungle', 'The Wise virgins', 'The stories of the East (a collection of the short stories which were weaved around the colonial Ceylon social sphere). To his credit were the play titled 'The Hotel' which depicts the imminent social calamities in the late 1930s, the five volume autobiography published in the 1960s under the titles Sowing, Growing, Beginning Again, Downhill All the Way and The Journey Not the Arrival Matters and his official diaries and collections of letters etc. (Roy, 2001) Arising out of his experiences and familiarity with wider social diversities, realities of the existence of human beings, socio cultural manipulative judgments on the incompatible human affiliations, there are vitally recognized empirical narratives, which elaborately fashion the colonial societal atmosphere of Ceylon; 'The Village in the Jungle' and 'The Stories of the East'.

'The Village in the Jungle' reflects the mystified yet culturally enriched native sphere of Sri Lanka, a colonized country during the time that the setting of the narrative is based on. Leonard Woolf as a colonial administrative officer endeavors to elaborately comprehend the unfathomable cosmos which intermingles itself with the obscured omnipotence of nature. With the imperial manipulation which excavates the roots of the native civilization and the repressive conventional taboos which force constraints on certain social functions, how the feminine figure of the native culture was made to be a fragile hollow being, is encapsulated by Woolf through this narrative. Salvation for the woman in the forms of political, cultural, physiological and psychological becomes impossible within the gender prejudiced conventional masculine context which empowers the superior subjectivity of male figure. Hence the narrative being empirically fashioned from the perspective of an observer in the outer sphere is attuned to portray the inner battle between the fragile native woman and dogmatic conventional superiority. The gendered subordination and the vulnerability of the feminine inferiority complex alter her cognition to be impoverished inducing her to secure refuge in the fact that the dependency on the masculine authority is the sole channel through which the feminine survival will be enhanced. Along with the emergence of the controversial matters within the colonized context the author illuminates the discouraging tensions which evolve pertaining to the existence of the feminine figure, for example femininity verses masculinity, culturally rooted taboos verses feminine emancipation, implementation of the colonial law versus female identity, religious mysticism versus feminine individuality and

ecological intimacy with natural cosmos versus feminine survival. As Woolf expresses in An imperial journey in the shadow of Leonard Woolf ;1904- 1911 (2005), 'The jungle and the people, who lived in the Sinhalese jungle villages fascinated, almost obsessed me in Ceylon. They continued to obsess me in London, in Putney or Bloomsbury and in Cambridge 'The Village in the Jungle' was a novel in which I tried somehow or other vicariously to live their lives….'(Ondaatje,2005)

The narrative thus delves into the inner structure of the native sphere scrutinizing the humanity, native life realm, cognitive order and the culturally moulded organic existence. Woolf deviating from the Eurocentric cultural assumptions and the ethnocentric imperial instincts approaches and views 'Beddegama' perceiving through a sympathetic and impartial mentality. The imperial intervention lies behind this literary portrayal of the unsophisticated yet mystified native life, still the author who remains as an observer from the unrelated outer sphere endeavors to interpret the lives of the natives living with them, involving with their life struggle and looking deep into their concealed muted instincts.

The Feminine figure – Historical and philosophical context

The role and identity of women are defined and conceptualized as the secondary negligible elements within the conventional superiority of the masculine social sphere. In consequence of the influential socio cultural and sociopolitical upheavals and transformations (colonization, industrialization, 1st World War, 2nd World War, feminist movement etc.) which practiced certain manipulative functionalities upon the miscellaneous social components, the role and identity of women were defined, produced and reproduced. Consequently the notable ideologies which constitute of psychoanalytical, sociological, political and theological analyses in relation to a variety of disciplines delve into the concept of 'Woman' and the social position to which she was circumscribed (Freudian theories, Lacanian system, feminism, Marxism etc.)(Brown, 1961), (Lacan, 2001),(Thapan, 1997),(Beauvoir, 1993).Thus the role of woman and the socially defined parameters of her identity oscillated between indefinite justifications confronting the repressive stereotypes that rooted in cultural, political, theological and economic realities.

The text 'The Village in the Jungle' depicts a faraway isolated village territory where the constant intrusions of the obscured natural and the relentless cultural forces make the inhabitants remain as the hollow figures. Amidst these vicious encroachments, woman exists as a subdued object onto which the harsh realities are poured. Since she exists within nature, her image appears as mysterious and vague while her approach to culture alters her 'self' to be a subordinate figure; thus, she is placed in the middle of irreconcilable relations between nature and culture.

Consequently the study was conducted to comprehensively analyze Leonard Woolf's portrayal of the feminine figure within his narrative 'The Village in the Jungle' placing a scrupulous concentration on the culturally fashioned authoritative social components and their physical and psychological hostility which resist the female identification with the realm of culture.

Hence the study delves into the native sphere in the colonial text 'The Village in the Jungle' viewing the 'feminine self' in relation to her existence and identity in the presence of the elements of cultural as well as natural sphere with the intention of comprehending to what extent the author Leonard Woolf became capable of identifying and portraying the female identification with the cultural and natural realms.

Methodology

The research was conducted comprehensively based on the novel 'The Village in the Jungle' by Leonard Woolf. Consequently, the vital concentration was given to the role and the communal recognition of the native woman in Sri Lankan sphere, the cultural prohibitions and social prejudices which encircle her identity, psychological and social realities of her existence and the deep-rooted linkage which she nourishes with the natural cosmos.

Since the narrative flows through the colonial realities, essentially the inadequacies of the colonial legal mechanism, the concept of colonialism was incorporated into the study. In analyzing the feminine existence within the dichotomous relationship between natural and cultural the foremost perspectives of Darwinism and psychoanalysis and the gender studies, anthropological and sociological studies are taken into consideration. Thus, theoretical perspectives of Simon de Beauvoir ('The second sex') (1993), Sigmund Freud, ('Civilization and its Discontents',) (2013), Slavoj Zizek, ('Looking Awry') (1992), Edward Said ('Culture and Imperialism') (1993) and Govind Kelkar and Dev Nathan (Gender Relations in Forest Societies in Asia)(2003) were referred with a thorough consideration.

The data collecting procedure is conducted utilizing the secondary data collection methods. Accordingly, the content analysis (conceptual analysis, relational analysis), discourse analysis and structural analysis were used in collecting and analyzing the relevant data. Through content analysis, the contents of the referred texts were thoroughly analyzed in relation to the basic themes that are elucidated within the study.

Furthermore utilizing the main two types of content analysis; conceptual analysis and relational analysis, the fundamental concepts, their relationship and the meanings they imply, their relation to the thematic perspectives of the study and rational assumptions they evolve, were identified and analyzed based on the key elements of the study.

Consequently, the discourse analysis was employed in critically analyzing the text 'The Village in the Jungle' concentrating on the dialogues within the text, most essentially, the conversational pattern and the manner in which certain words are used.

Pursuing the means of structural analysis, the relevant texts were studied scrutinizing the characters, the active details (motifs, symbols), themes, the perspectives that were developed and connoted by the author through the portrayal of characters, setting and the language.

Results and Discussion

The Feminine being and the realm of Nature

In the novel 'The Village in the Jungle' the cultural taboos, religious prejudices, the colonial intervention and the implementation of law amalgamate together in subjugating the 'Woman' proclaiming herself as a dependent, object of masculine self-gratification and more explicitly through the dimension of indigenous perspectives, her role is viewed as a threatening force.

As Simon de Beauvoir exemplifies in 'The Second Sex' (1993),
'In woman are incarnated the disturbing mysteries of nature…'
'Condemned to play the part of the other, woman was also condemned to hold only uncertain power: slave or idol, it was never she who chose her lot.'

Thus, the concept of woman is given the validation only through the identification of the feminine self with her predefined gendered subalternity. While the female figures remain as muted bodies surrounded by the fetters of cultural principles her intuitive linkage with the natural cosmos stimulates her impulses to resist her victimization embodying herself as an enigmatic organism of natural whole towards which culturized social spheres possess a clandestine anxiety and fear.

'In patriarchal societies woman retains many of the disquieting powers she possessed in primitive societies. That is why she is never left to nature, but is surrounded with taboos, purified by rites placed in charge of priests.' (Beauvoir, 1993)

As illustrated within the novel, the irrational fear which the realm of culture senses in relation to the separated yet mystified reality that the feminine figure creates through her physical and psychical individualities marginalizes her as an agonizing presence. The tragic death of 'Hinnihami' in the novel depicts the severe repugnance that the culture cultivates in repudiating the ambiguous yet intimate identification of woman with the omnipresent nature.

Viewing through this sense the female being who attaches herself to the objects and forces of nature neglecting the cultural demands in exposing herself towards the obscured magnetism of natural power, becomes a gloomy evil force within the perception of culturized beings.

'If, on the other hand, woman evades the rules of society, she returns to nature and to the demon, she loses uncontrollable and evil forces in the collective midst. Fear is always mixed with the blame attached to woman's licentious conduct…' (Beauvoir, 1993)

Arising from this naturalized irrational image of female being to which the culture pours the prejudiced wrath, emerges another female form, an epitome of femininity which the masculine being desires. While her affinity with nature is perceived as foul and scandalous, in another perspective the impression she creates through her harmonization with nature evolves a valued appearance within the complex of culture owing to the feminine representation of the aspects as fecundity, emotional sensitivity, maternal warmth, courageous endurance, affectionate flexibility, the qualities that the feminine selfinherits through her instinctive linkage with nature. Accordingly, in exemplifying these perspectives further, an extract from the text 'The Second Sex' (1993) by Simon de Beauvoir can be stated as follows,

'…then man dreams losing himself anew in the maternal shadows that he may find there again the true sources of his being. The mother is the root which, sunk in the depths of the cosmos, can draw up its juices; she is the fountain whence springs forth the living water, water that is also a nourishing milk, a warm spring, a mud made of earth and water, rich is restorative virtues.'

The mutual cycle, the reciprocal affiliation which evolves encircling the feminine figure and the natural cosmos equate one with the other personifying the inhuman nature as a feminine presence while woman is attributed the characteristics of natural elements. Hinnihami, the embodiment of the obscured and mystified texture of nature brings to the surface this universal woman- nature similitude. Consequently, this absorption of feminine being in the realm of nature, their identification with each other are discussed through the extracts stated below,

'Woman sums up nature as Mother, wife and ideal; these forms now mingle and now conflict, and each of them wear a double visage.' (Beauvoir, 1993)

In spite of the valued and mystified appearance that the feminine self and nature sustain, the culturized masculine figure and the patriarchal social structure which are identified with the aspects such as authority, rationality and gendered superiority tend to imagine and accept the fact that those two elements; woman and nature are to be dominated

and kept repressed under their influence since both human and inhuman components are viewed as morally and naturally inferior to the cultural and masculine domain. Consequently, it can be further theoretically exemplified as follows,

'According to the perspectives of Karen J Warren, 'a patriarchal conceptual framework subordinates both women and nature by feminizing nature and then assuming that both women and nature are inferior ('down') to men and men's culture.' (Warren, 1994)

Thus, in relation to the text 'The Village in the Jungle' the feminine characters like Hinnihami, Punchi Menika; the natural elements such as jungle, hunted doe, fawn which was stoned to death embody the victimization of woman and nature by the cultural masculine command. Accordingly, they connote the identical pathetic image and destiny which were forced upon them by the prejudiced cultural mechanisms.

Agrarian communal patterns and the native female being

Sri Lankan native cultural sphere which is enriched by the indigenous horticultural life patterns and the appearance of the Buddhism and to a certain extent the influence of Hinduism exists associating with collective belief and value systems. The recognition of women figures within this communal sphere tends to be less prejudiced and discriminated though she remains to be the docile secondary body locating her 'self' under the influence and shelter of the masculine figure. Since the patriarchal social order is embedded within the native culture of the Sri Lankan context, the communal affiliations are arranged to regard the masculine figure as the core of their shared sphere.

Viewing the gender relations and the division of labour which are centred around the agrarian ritualistic and communal patterns, it can be analysed that the feminine being is assigned certain responsibilities thus recognizing her as a significant role whose shared assistance enhances a sense of balance pertaining to the social and economic aspects.

'The economic system of the ancient Sri Lanka made lot of demands from the female partner of the family. The wife played either an equally important role as husband or a role of secondary importance in earning a livelihood'. Munasinghe, 2004,)

Accordingly, the text 'The Village in the Jungle' depicts the native village 'Beddegama' to be an agrarian community where the native villagers engage in cultivation, more explicitly the Chena cultivation. Along with the strenuous physical labour of the men, women engage themself with their duties assuming an equal importance. Thus, the author in the text 'The Village in the Jungle' illustrates how the female characters 'Hinnihami' and 'Punchi Menika' engage

physical labour without being restricted to a domesticated frail body.

"... And when the Chena season began, they worked like the men and boys in the Chenas. They cut down the undergrowth and burnt it: they cleared the ground and sowed the grain; they lay out all night in the watch huts to scare away the deer and wild pig which came to damage the crop."(Woolf, 1992)

In observing the feminine figure in the text 'The Village in the Jungle' it can be elucidated that though the severe marginalization and conflicts are not evolved pertaining to the feminine identity, she has to perform and comply with what the traditional principles demand from her. For instance, depiction of female characters like Karilinahami, Punchi Menike and other village women appear as perfect examples of this traditionally necessitated role of woman.

Karilinahami; '...Unlike her brother she as always busy, sweeping the house and compound, fetching water from the tank, cooking, and attending to the children.' (Woolf, 1992) Punchi Menika; '... she became the man's woman, the cook of his food, the cleaner of his house, and bearer of his children' (p 40)

Consequently viewing the feminine figure whose dynamic patterns of duties locate her 'self' within a particular cultural stratum, the text 'The Village in the Jungle' critically assert the fact that to the extent the native female adopts the cooperative role which the society expects without negating cultural demands, her social existence and identity will be secured and accepted by the realm of culture.

In perceiving the women's role within the conjugal relationship in relation to this Village context it can be interpreted that she is expected to assist and provide the necessities of her spouse in every possible manner; thus though she is not viewed with severe discriminating prejudices and is regarded as a favourable character in relation to her role as a maternal figure and helpful co-worker, still what her assigned duty as a wife is to satisfy the needs and requirements of her spouse remaining as a submissive obedient companion under the guardianship and protection of the husband.
Babun; 'It is time that I took a wife to cook my food and bear me children' (Woolf, 1992)

Punchirala; 'A man without a wife, they say, is only a half man. There is no comfort in a house where there is no woman to cook the meal' (Woolf, 1992)
The above excerpts which are brought out from the text connote the masculine perceptions which are manipulated by the patriarchal cultural assumptions pertaining to the role of the female spouse and marital relationship. As Simon de Beavoir exemplifies in 'The Second Sex' (1993) there are two reasons that can be focused on, which are projected upon the concept of marriage in implying the necessity of the female existence within the connubial affiliation.

'The first reason is that she must provide the society with children... the second reason why marriage is enjoined is that woman's function is also to satisfy a male's sexual needs and to take care of his household.'

Since the traditional native sphere which is portrayed within the text seems to be existing with the cultural values of the patriarchal order, the communal, essentially the psychological behavioural patterns of the inhabitants are moulded and altered to meet the particular cultural demands. Consequently, the women who are combined with a matrimonial relationship, as portrayed through the text 'The Village in the Jungle', tend to identify themselves as constant dependents on their male spouses and they are without strict resistance accept their secondary role thus allowing themselves to be defined as destined to the life of domestic routine. Though she is recognized as 'mother of the children' and 'woman of the house', still her identity is limited to the domestic sphere and she becomes incapable of exposing and maintaining her individuality. She views the world, represents her role and recognizes the other through her linkage with him; she negates her personal desires, but yearns what he wants; she creates her world, her 'self' through him; and in a more complete sense she turns herself to be a mere element of his masculine world. Accordingly, the instinctive and behavioural transformation that the female character 'Punchi Menika' undergoes in recognizing herself with the nuptial bond can be portrayed through the excerpts that taken from the text as,

'And Punchi Menika altered. Her blind love for her father and her sister remained, but it was swamped by a fierce attachment to Babun. The simplicity of Babun reacted upon her. She became the man's woman, the cook of his food, the cleaner of his house and bearer of his children' (Woolf, 1992)

Consequently the portrayal of the native woman within the text 'The Village in the Jungle' pertaining to her role as a 'wife' seems to voice the destiny which waits upon her, yet unknown to her culturized consciousness; the destiny of existing in relation to and for the sake of somebody else rather than for her own self through the cancellation of her individuality.

Conclusion

The colonial text 'The Village in the Jungle' by Leonard Woolf through its elaboration about the native community approaches the native female figure endeavouring to define and identify her true essence and the affinity and with nature. The gendered subaltern consciousness of the woman, as the author illustrates within 'The Village in the Jungle' accompanies her 'self' towards the 'muted invalid bleak zone' from which her existence becomes accessible to the negation, deprivation and obliteration.
Approaching the village 'Beddegama' and viewing the

obscured, withered, mystified, weakened and isolated femininity which resides there, it can be observed the fact that to whatever extent her 'self' is made to be submissive still she possesses a certain influence upon the other .For instance the characters like Karlinahami, Nanchohami(the headman's wife) and Hinnihami seem to suggest how the women are allowed to become independent to some extent in certain ways such as in decision making, upholding their views based on their particular social role; mother, wife and daughter.

Thus, within the text, 'The Village in the Jungle' the gradual social transformation which flows through the native boundaries owing to the colonial manipulative elements, leads the role of women to be interpreted with a new dimension. Consequently, the feminine figure which is portrayed in the text through her intrinsic affinity with the natural sphere appears as an epitome of both pure and impure forces.

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Original Article

Awareness and practices regarding dental health among pregnant women attending antenatal clinics in Sri Jayewardenepura General Hospital, Sri Lanka

Samarathunga, S. M. I. S. K., Gamage, K. G. C. K., Welahetti, S. R., Lakmali, H. K. K., Hemali, I. D.T., Sewwandi, K. P. A., Priyadarshani, U. G. N*

Department of Nursing, KIU, Koswatta, Battaramulla, Sri Lanka

Abstract

Dental health is an important aspect of health. Further, teeth related dilemmas are common in pregnancy and thus has influences on the growing fetus. The study was conducted to assess awareness and practices regarding dental health among pregnant women, who attended the antenatal clinic at Sri Jayewardenepura General Hospital, Sri Lanka in 2018. A descriptive cross-sectional study was conducted with the participation of randomly selected 150 pregnant women who attended antenatal clinic, by using pre-tested interviewer administered questionnaire. Knowledge and practices scores were developed based on the maximum and minimum marks allocated for each section. Pearson Chi-square test was performed to determine the associations. Of the participants, 70% (n=105) were aware regarding the fact that hormonal imbalances during pregnancy may affect their dental health. However, only 21.3% (n=32) had awareness regarding the fact that frequent vomiting during pregnancy period is a risk factor for dental erosion. Further, 56.7% (n=85) of the participants were knowledgeable regarding the influence of mother's dental health on their growing fetus. Most frequent source of knowledge regarding the importance of dental health during pregnancy was the family doctor (40%, n=60) in participants, 54% (n=81) had good knowledge regarding dental health during pregnancy. Regarding overall level of dental care practices, only 33.3% (n=50) had good dental care practices. Age (p=0.02), level of education (p=0.01) and monthly income (p=0.01) showed a significant association with dental care knowledge while, the level of education (p=0.01) showed significant association with dental care practices among participants. Although more than half of the participants had good knowledge regarding dental health, less than one fourth of individuals were following proper dental practices. This study emphasizes the importance of conducting health education programmes to reduce the knowledge practice gap and to highlight the importance of dental care practices during pregnancy for better health outcome towards mother and baby.

Keywords : Awareness, Practice, Dental health, Pregnant women, Patriarchy

Introduction

Oral health consists of different aspects including speaking ability, smile, smell, chew, swallow, touch and express different emotions through facial expressions confidently without any pain, discomfort or craniofacial complex disease (Glick et al., 2016). Pregnancy is a unique period during a woman's life and is characterized by complex physiological changes, which may adversely affect oral health. At the same time, oral health is key to overall health and well-being.

Changes in salivary composition in late pregnancy and during lactation may temporarily predispose to dental caries and erosion (Laine, 2002). Further, the number of salivary cariogenic microorganisms may increase in pregnancy, concurrently with the decrease in salivary pH and buffer effect (Laine, 2002). Study in 2012 reports that pregnant women in rural areas had a significantly higher experience of decayed and filled teeth. It was also reported that untreated dental caries was twice that when compared with urban women (Karunachandra, 2012).

There are significant barriers to request dental care in pregnant mothers including limited access to affordable dental services and lack of knowledge about the importance of maternal oral health (George et al., 2013). Results of another recent study conducted in South India revealed that despite the presence of pain due to dental causes, utilization of dental services by pregnant women was poor (Shenoy & Chaco, 2013). Previous reports suggest that knowledge related to oral health of pregnant women during pregnancy is low and needs to be improved. Further, oral health practice was also not sufficient and therefore proper health education is necessary to maintain good oral health. Additionally, attitude towards dental visit also needs to be improved (Leelavathi et al., 2018). Many studies have been conducted regarding knowledge and practices on dental health care among pregnant women in developed countries. However, there is a lack of epidemiological data regarding above matter in Sri Lankan context. Therefore, the findings of this study are helpful to identify, level of knowledge and practice regarding dental health practices among pregnant women and to implement measures to improve individual's knowledge and practices on dental health maintenance during pregnancy. Collectively these will enable to enhance the quality of life of pregnant women and lead to healthy newborns.

Methods

A descriptive cross-sectional study was conducted among pregnant women attending antenatal clinic of Jayewardenepura General Hospital in 2018. The objective of the study was to assess the awareness regarding dental health among pregnant women who attended the antenatal clinic of Sri Jayewardenepura General Hospital. Simple random sampling method was used to collect the sample from all the clinic attendees. Pre-tested interviewer administered questionnaire was used to collect data regarding demographic and personal characteristics, awareness regarding dental health maintenance and dental health problems. Both descriptive and inferential analyses (Chi square test) were performed on SPPSS 23.0 software. Questionnaire results were numerically coded for questions on knowledge and practices regarding dental health.

The total maximum mark which could be obtained for knowledge section was twelve with a minimum of zero. The total score was categorized into three groups. Individuals who scored 0-3 were considered as having poor knowledge, those who scored 4-6 points, were considered as having moderate knowledge and those who scored 7-12 points, were considered as having good knowledge. Regarding practice score, the total maximum mark which could be obtained was 10 with a minimum of 0. Ethical approval was obtained from Ethics Review Committee of KIU (KIU/ERC/18/32) and permission was obtained from Director of Jayewardenepura General Hospital, relevant consultants and clinic heads. Written informed consent was obtained from the participants as well. Data collection was done without interfering with treatment and clinic follow up activities. Safety and the confidentiality of the data were ensured.

Results and Discussion

Of the 150 participants, majority (58%, n=87) were in the age group of 18-30 years. Of them, 18.7% had education up to ordinary level. Among the participants, 46.7% (n=70) were employed. Of the pregnant women 60% (n=90) were in their 3rd trimester of pregnancy while 10.7% (n=16) were in the 1st trimester of pregnancy (Table 1).

Table 1: Socio-demographic and personal characteristics of the study sample (n=150)

Demographic characteristic	Frequency (n=15	Percentage
Age category / Years		
18-30	87	58.0
31-40	60	40.0
41-45	3	2.00
Education level		
Up to grade 05	1	0.667
Grade 5 to 11	5	3.33
Passed GCE O/L	28	18.7
Passed GCE A/L	116	77.3
Occupation		
Yes	70	46.7
No	80	53.3
Family income per month (LKR)		
Less than 10,000	1	0.667
10,000-15,000	1	0.667
15,000-20,000	10	6.67
More than 20,000	138	92.0
Trimester of pregnancy		
Less than 03 months	16	10.7
Between 03-06 months	44	29.3
More than 06 months	90	60.0

Of the participants, 56.7% (n=85) knew that untreated long-term periodontitis results in premature birth. However, only 26% (n=39) were aware about influence of untreated dental caries on the health of the child. Of the participants 21.3% (n=32) have identified that, frequent vomiting during pregnancy causes dental erosion in the mother, while 70% (n=105) were knowledgeable that hormonal imbalance during pregnancy affect the mother's dental health. In this study, 20.7% (n=31) had received the information from the obstetrician on the impact of oral health in pregnancy. This is higher than a study conducted in India which reported that, only 4% of pregnant women had received such information from their obstetrician (Gupta et al., 2015). The discrepancy of these results shows the difference of obstetrician client contacts between the two countries and a better health education system seems to be in place for Sri Lankan pregnant women visiting anti natal clinics compared to India. However, the percentage is less than a study conducted in USA, which reported 54.9% awareness regarding importance of dental health during pregnancy to seek dental care during pregnancy (Gaffield et al., 2001). The study by Gaffield et al highlights that pregnant women in developed countries are concerned regarding dental health maintenance than their counterparts in developing countries.

Most of the participants had a moderate level of overall knowledge about dental health maintenance during pregnancy (62.7%, n=94). Only 34.7% (n=52) of participants had good overall knowledge regarding dental health (Fig. 1). Percentage of individuals having overall good oral health knowledge (34.7%) is higher than 12% which has reported in a study conducted in Sudan (Ibrahim et al., 2016) which shows more exposure to antenatal education and improved maternal health care in Sri Lanka than in Sudan. However, the percentage of participants with overall good knowledge is lower than a study on the topic of oral health status, practices and knowledge among pregnant women in Sydney, which determined 79.1% were knowledgeable regarding dental care (George et al., 2013). This difference may be due to demographic and educational differences of the individuals in the two countries including educational resources. The data from this study highlights the importance of improving antenatal education facilities as in developed countries.
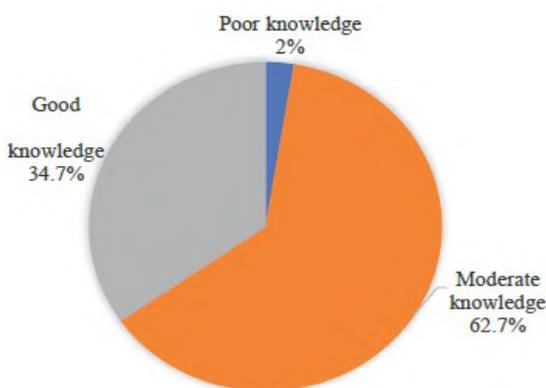
There were statistically significant associations of overall knowledge regarding dental care with age (p=0.02), educational level (p=0.01) and monthly income (p=0.01).The findings are contradictory to a study conducted among Nigerian women which showed no statistically significant association of knowledge regarding dental health with age (p=0.166) or level of education (p=0.079) (Abiola et al., 2011). The reason may be that Nigerian women's accessibility to antenatal educational services may be low irrespective of the age or level of education.

Of the participants 90% (n=135) of pregnant women reported that they brushed their teeth twice a day, while 6.7% (n=10) brushed their teeth more than twice a day. This finding is higher than findings of a study in Nigeria which revealed only 32.9% women brushed their teeth twice a day and 1.5% for more than twice a day (Abiola et al., 2011). Reason for the disparities between the studies may be because Sri Lankan pregnant women are more concerned and knowledgeable regarding personal hygiene than African women.

More than half of the participants (60%, n=90) had moderate level of practice about dental health. Only 33.3% (n=50) of participants were following good practice regarding dental health (Fig. 2). Level of education (p=0.01) showed a significant association with dental care practices. The association is consistent with the finding of a study conducted in India (Payal et al., 2017) which revealed that educational status showed a significant association with dental care practice. In this study, there was no statistically significant association of dental care practices with age or poor hygienic habits. However, associations were found with age and poor hygiene habits in a study (Payal et al., 2017) in India.
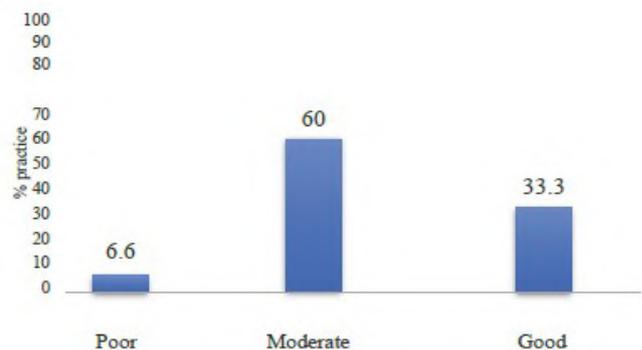
Fig. 2: Dental care practices (n=150)

Conclusion

Although most women surveyed showed moderate level of knowledge, the results highlight important gaps in their oral health practice. This study emphasizes the importance of conducting programmes to reduce the knowledge practice gap and to highlight the importance of dental care practices during pregnancy to reduce the knowledge, practice gap for better health outcome towards mother and baby.

Fig. 1: Level of overall knowledge regarding dental health (n= 150)

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International Journal of KIU

Original Article

Relationship between perceived stress, general self-efficacy and socio-demographic factors of an undergraduate student population in Sri Lanka: A cross-sectional study

Walpola L. H.[1], Wijekumar P. J.[1], Wadduwage S. S.[1], Ranadeva N. D. K.[1]*, Chakrewarthy S.[2]

[1]*Department of Biomedical Science, Faculty of Health Science, KIU, Sri Lanka*
[2]*Department of Biochemistry and Clinical Biochemistry, Faculty of Medicine, University of Kelaniya, Sri Lanka*

Abstract

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*Corresponding Author *nadeeka @kiu.ac.lk*

Nearly 80% of students in higher education worldwide experience psychological stress during their university life due to various stressors. Stress among students can be viewed as the body's reaction, both neurologically and physiologically, to adapt to new conditions. Stress can lead to poor academic performance and underachievement among students. The present study assessed the levels of perceived stress, general self-efficacy, and their association with socio-demographic factors among a selected group of undergraduates at a higher educational institute. A descriptive cross-sectional study was performed using stratified random sampling among 393 undergraduates. The data were collected through the Perceived Stress Scale (PSS-10), General Self-Efficacy Scale (GSES) and a questionnaire to determine the socio-demographic factors. The data were analyzed using IBM SPSS version 23. The mean age of the sample (n=393) was 22.36±2.33 years. The results showed a mean perceived stress score of 20.72±4.96, indicating moderate perceived stress. The majority of the participants (79.4%) had moderate perceived stress, followed by high stress (12.7%) and low stress (7.4%). There was no significant difference between the stress levels of male and female students. No significant association was observed between perceived stress and socio-demographic factors assessed (age, gender, civil status, residence status, financial status, the program of study, employment prospects) using the chi-squared test. Spearman correlation showed a statistically significant negative correlation between perceived stress levels and general self-efficacy (p<0.001, r = -0.293). Intervention strategies to reduce perceived stress and to improve general self-efficacy should be implemented among the undergraduates. Further studies are needed to understand the factors contributing to stress and their interrelations among undergraduate students.

Keywords: Perceived stress, General self-efficacy, Higher education

Introduction

Stress is one of the predators that has been evolving silently among mankind and reaching the "Health Epidemic of the 21st century," as reported by the World Health Organization (WHO). Hans Hugo Bruno Selye, the "Father of stress," defined stress as "the non-specific response of the body to any demand for change" thus, it can be considered to affect the health of a person. Good health can be viewed as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (WHO, 1946).

Stress can cause a catastrophic impact on an individual if not identified and treated. Long term higher levels of stress can lead to depression, hypertension, headaches, back pain, skin disorders, irritable bowel syndrome, ulcers, panic disorder, general adaptation syndrome, phobia, and post-traumatic stress disorder (PTSD) (Badur-un-Nisa, Kashif, & Khan, 2016). Moreover, stress is a well-known contributor to mood swings, mental disorders, and it also increases suicide risk (Ang & Huan, 2006). Globally, nearly 800,000 people die due to suicide every year, which is one person every 40 seconds. Suicide thoughts can stir up people at any point in their lifespan, and it is considered the second leading cause of death among 15-29-year-olds globally (WHO, 2019). According to the 2020 World Population Review, Sri Lanka is reported to be the 29th country, showing a high rate of suicides, and this can be emphasized as an issue of concern. Further, the suicide rate for Sri Lanka is reported as 14.6 suicides per 100 000 in 2020 (World Population Review, 2020).

Stress has become a striking issue among young adults. A recent study done in Sri Lanka revealed that the second-leading age group that becomes a victim of stress lies between 20 – 30 years (Senavirathna & Sanjeewani, 2019). At this particular age, most of these young adults are engaged in tertiary education, and thereby it is noteworthy that higher education challenges might be a contributory factor for stress levels of young adults. Globally, around 80% of students following higher education experience stress during their lives (Scott, 2009). The WHO had predicted an increase of related psychological problems from 10% in 1990 to 15% in 2020 among students in tertiary education worldwide. In the United Kingdom, it's estimated that stress causes a minimum of 600 students (15–24 year-olds) to commit suicide every year, and further, a survey done in 2009 by the American College Health Association indicated suicide as the second leading reason for death among college students (Poon, Lee, & Ong, 2012). According to one of the Sri Lankan studies, psychological distress is more significant among university students than in the general population in Sri Lanka (Kuruppuarachchi, Kuruppuarachchi, Wijerathne, & Williams, 2002).

Furthermore, previous studies had emphasized that perceived stress varies among different socio-demographic groups (Pau et al., 2007). The majority of students with

stress reported high scores of poor self-esteem, and about half scored high on depression scales (Bedewy & Gabriel, 2015). Self-efficacy has shown high correlations with self-esteem, self-regulation, and optimism, as well as being inversely correlated with depression, anxiety, and lower mental health status (Kumar, Talwar, & Raut, 2014). Various attempts have been made to assess the stress levels and to discover the factors that contribute to higher stress levels. Research evidence concludes that social, emotional, and physical conditions affect the ability of proper learning and education. Socio-demographic factors, gender, rural or urban background, financial constraints, marital status, and type of residence were found to be some of the critical factors behind high-stress levels (Rathnayake & Ekanayaka, 2016; Raushanova et al., 2015).

Further, university students endure a critical transitory period in which they transform from adolescence to adulthood and can be one of the most stressful times in a person's life (Buchanan, 2012). The perception of life events during this transformation is a fundamental need at present to assess the stress levels of the university population, as they are the future workforce in any country. Early detection and assessment of stress levels in students will be beneficial where identification of the level of stress can lead the way to reduce or prevent it from developing into a chronic or severe form of stress that may ultimately lead to catastrophic outcomes such as suicidal thoughts. At the same time, they can be directed to necessary support from the expertise and control their stress level, which will enable them to have a healthy life and encouragement to face the challenges in a university setting. Most of the universities in Sri Lanka have counseling systems, where some of the students gain support, but unfortunately, the majority chose to suppress their problems and mental status where the outcome becomes cataclysmic. Therefore, the current study was implemented to evaluate the students' perceived level of stress and general self-efficacy and their association with socio-demographic factors to find potential stress-causing factors among the undergraduates. The findings of this study strengthen the evidence on this avenue. Also, it seals the gaps of knowledge that will be beneficial to society in discovering and understanding the factors of stress. Moreover, it will pave the way for finding potential solutions for this critical issue among undergraduate students.

Methodology

A descriptive cross-sectional study was conducted at a Higher Educational Institute (HEI) in Sri Lanka in 2019 among a selected group of undergraduates following various study programmes. The samples were selected by stratified random sampling according to the program of study. Ethical approval for the study was obtained from the Ethics Review Committee of KIU (KIU/ERC/19/12). The sample size was calculated using the following equation; $n = N / 1 + N e^2$

(Yamane, 1967). A total of 393 undergraduates were randomly recruited into the sample. The inclusion criteria were undergraduate students of the institute, and the exclusion criteria were participants with previously diagnosed psychiatric disorders, chronic illness, and pregnancy.

Data were collected using pre-tested self-administered questionnaires consisted of socio-demographic data, perceived stress scale (PSS-10), and general self-efficacy scale (GSES). The socio-demographic section consisted of 10 questions, which are related to the student's personal and socio-demographic details. The perceived stress scale consisted of 10 items, created by Sheldon Cohen and was used to assess the stress level about feelings and thoughts of all the participants during the past month. The scores were given based on a point scale as 0-never, 1-almost never, 2-sometimes, 3-fairly often, and 4-very often. The total PSS scores ranging from 0-13 were considered as low stress, 14-26 as moderate stress, and 27-40 as high perceived stress (Cohen, 1994). The general self-efficacy scale was correlated to emotion, optimism, and work satisfaction. It consisted of 10 questions designed by Schwarzer et al. The scores were given based on a four-point Likert scale as 1-not at all true, 2-hardly true, 3-moderately true, and 4-exactly true. The total scores ranging from 10 to 40 is considered as high general self-efficacy (Schwarzer & Jerusalem, 1995).

All information obtained from participants was kept strictly confidential. Statistical analysis SPSS version 23 was used for all data processing and analysis. A descriptive statistics tool was applied to the response given by the students. The chi-square test analyzed categorical data, and the Shapiro Wilk test was applied for the normality check of the data obtained from participants. Spearman correlation analysis was used for the data that deviated from the normal distribution. The level of significance was set at two-tailed with $p > 0.05$.

Results and Discussion

Demographic profile

A total of 393 undergraduates participated in the study. Among the total undergraduates (n=393), there were 301 (76.6%) females students. The mean age of the sample was 22.36 ± 2.33 years. Of the study participants, 87.3% (n=343) were in the age group of 20-23 years. The majority of the students were living with the parents (57.8%), followed by private accommodation (33.1%), university hostels (4.6%), nursing quarters (2.3%), and other resident areas (2.0%). Table 1 shows the distribution of participants according to the socio-demographic profile.

Perceived stress level

All the undergraduates had stress to some extent, and the perceived stress scale showed 312 (79.4%) students had moderate perceived stress among the study group (236 females and 76 males). Of the sample, 50 (12.7%) students had high perceived stress (42 females and 8 males), while 31 (7.9%) students had low perceived stress levels (23 females and 8 males) Figure1.

The mean perceived stress among female and male students was 20.86 ± 4.97 and 20.27 ± 4.92 ($p > 0.05$), respectively. No significant difference was observed between perceived stress levels and any other socio-demographic data among the undergraduates (Table 1).
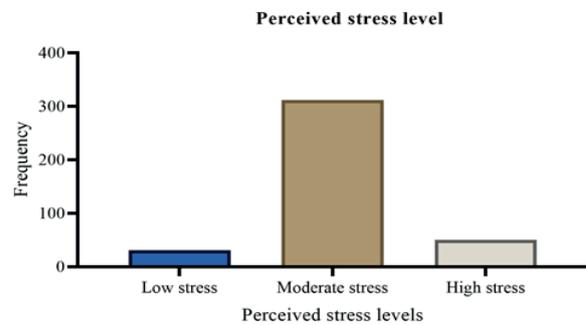
Figure 1: Preceived stress level among participants

General self-efficacy (GSE)

The median score of the GSE scale among the students was 27, and this value was taken as the cut off value to determine the two groups **(V. Kumar et al., 2014).**

Of the sample,51.7% had high self-efficacy (GSE > 27), while 48.3% had low self-efficacy (GSE < 27) (Figure 2). It was found that the general self-efficacy level was significantly associated with residence (p=0.036) and civil status (p=0.014) of students. There was no significant difference in the general self-efficacy level among socio-demographic factors assessed (Table 1).
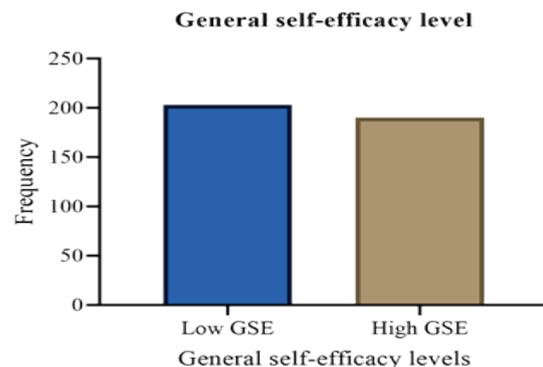
Figure 2: General self-efficacy levels among participants

Correlation between perceived stress level and general self-efficacy among participants

The Shapiro Wilk test showed that the data were not normally distributed (p>0.05). Through the Spearman correlation test, the results showed a statistically significant negative correlation between perceived stress levels and general self-efficacy (p<0.001, r=-0.293) among the participants of the study. Figure 3

Figure 3: Correlation between perceived stress level and general self-efficacy among participants. P<0.001, r=-0.293

Table 1: Association of perceived stress level and general self-efficacy level between socio-demographic factors among participants (n=393) *p-value <0.05

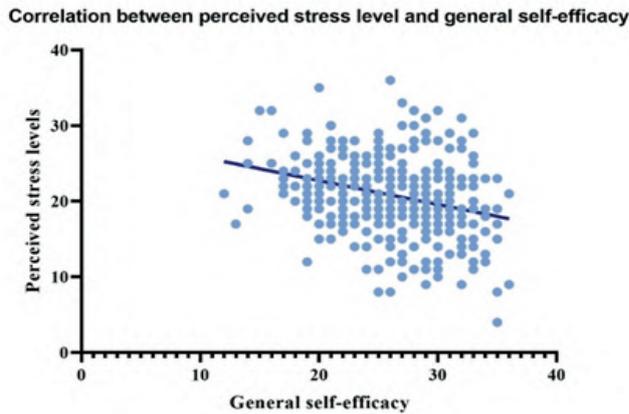| Socio-demographic factors		No. of participants (%)	Perceived stress level		General self-efficacy level	
			mean	p-value (p<0.05)	mean	p-value (p<0.05)
Gender	Female	301(76.6%)	20.86 ± 4.97	0.409	26.27 ± 4.59	0.901
	Male	92 (23.4%)	20.27 ± 4.92		26.77 ± 4.92	
Civil status	Unmarried	383 (97.5%)	20.75 ± 4.96	0.741	26.29 ± 4.71	0.014*
	Currently Married	10 (2.5%)	19.70 ± 4.83		30.10 ± 2.69	
Residence	Living with parents	227 (57.8%)	20.92 ± 5.06	0.927	26.35 ± 4.57	0.036*
	Boarding place	130 (33.1%)	20.43 ± 4.99		26.12 ± 4.88	
	University hostel	18 (4.6%)	20.72 ± 4.59		28.50 ± 5.14	
	Quarters	9 (2.3%)	20.22 ± 3.19		25.00 ± 3.43	
	Other	8 (2.0%)	20.38 ± 4.75		29.50 ± 4.41	
Only child	Yes	45 (11.5%)	20.40 ± 5.39	0.640	25.44 ± 4.95	0.229
	No	340 (86.5%)	20.79 ± 4.92		26.56 ± 4.70	
Study program	BMS	174 (44.3%)	20.45 ± 5.16	0.150	26.63 ± 4.43	0.248
	Management	117 (29.8%)	21.26 ± 4.37		26.22 ± 5.01	
	Psychology	71 (18.1%)	20.58 ± 5.65		25.85 ± 4.91	
	Nursing	16 (4.1%)	19.94 ± 2.44		25.31 ± 3.86	
	Acupuncture	12 (3.1%)	22.75 ± 4.79		28.50 ± 5.45	
	Kaatsu	3 (0.8%)	14.67 ± 2.52		29.33 ± 3.51	
Current year of study	First-year	179 (45.5%)	19.96 ± 4.95	0.888	26.25 ± 4.92	0.689
	Second-year	178 (45.3%)	21.36 ± 4.95		26.24 ± 4.57	
	Third-year	34 (8.7%)	21.26 ± 4.73		26.50 ± 4.54	
	Fourth year	1 (0.3%)	23.00		27.00	
Financial method for studies	Parent's support	106 (27%)	22.51 ± 5.18	0.389	26.12 ± 4.68	0.256
	Student loan	260 (66.2%)	20.10 ± 4.81		26.42 ± 4.76	
	Occupation during semester	21 (5.3%)	19.38 ± 3.68		26.33 ± 4.36	
	Occupation during breaks	4 (1%)	18.50 ± 1.00		30.75 ± 2.50	
	Scholarships	1 (0.3%)	25.00		33.00	
	Other	1 (0.3%)	26.00		25.00	
Employment status	Full time	49 (12.5%)	21.10 ± 4.19	0.527	26.24 ± 4.30	0.272
	Part-time	41 (10.4%)	21.24 ± 5.91		27.98 ± 4.56	
	Contract-based	2 (0.5%)	22.50 ± 4.95		29.00 ± 7.07	
	Training/ Internships	9 (2.3%)	24.11 ± 4.01		26.89 ± 3.44	
	Unemployed	282 (71.8%)	20.46 ± 4.99		26.16 ± 4.78	
	Other	3 (0.8%)	22.33 ± 5.13		20.33 ± 2.31	

Discussion

Stress has been defined as the imbalance of physical, mental, and social well-being; thus, it can be considered to affect the health of a person (Fink, 2017). Further stress affects a person's productivity either by increasing it (eustress), resulting in optimal performance or decreasing it (distress), leading to poor performance and underachievement (M. Kumar, Sharma, Gupta, Vaish, & Misra, 2014). The present study assessed the perceived stress (PS) levels of undergraduate students at a selected HEI and the association between perceived stress with various demographic factors and general self-efficacy.

Studies done in many regions of the world have come up with varying amounts of stress levels among undergraduates. In a study conducted by Ranasinghe et al., an average PS score level indicating moderate stress level was reported among medical undergraduates in the 2nd year, 4th year and 5th year (Ranasinghe et al, 2017). Similarly, many other studies worldwide reported a moderate perceived stress level among the students following higher education (Kashif et al., 2016). The risk for disorders related to depression and anxiety can be predicted by the perceived stress level (Rosal et al, 1997). According to numerous studies, higher levels of depression and anxiety were associated with higher levels of stress (Bunevicius, A., Katkute, A., & Bunevivius, 2008).

In the present study all the participants showed perceived stress to some extent (low, moderate, and high), with the highest number being among the moderate perceived stress levels. This indicates that students have a moderate vulnerability to stress. Having a moderate stress level among the majority of the undergraduates and a comparatively lower percentage having a high-stress level in the present study could be a positive sign where the risk of depression and anxiety related disorders could be comparatively less in this student population. However, if appropriate measures are not taken to resolve the moderate stress in these students, it might advance into chronic stress and ultimately into high levels of stress. Thus, identifying the low stress levels and moderate stress level is important in securing the good mental health of these students by the necessary interventions such as counselling sessions, stress release activities that can be implemented among higher education institutes.

The present study showed that the mean perceived stress score was 20.72 among participants. The mean score was comparable to an approximate score of 20 from 2nd year Sri Lankan medical undergraduates (Ranasinghe et al., 2017),

and 19 from students in a Turkish University (Örücü & Demir, 2009). The differences in the mean age of participants in these studies may have contributed to the differences in PS scores. Furthermore, the results among these studies may have been affected and varied by biases that resulted from culture, social status, educational background, and the main subject of the study. Moreover, the higher stress score has predicted that university life can be exhausting for students with an increasing load of academic work, career development, and family problems according to other studies (Pau et al., 2007; Raushanova et al., 2015). The study carried out by Wani et al. have found a high prevalence of burnout among medical students as per the existing undergraduate curriculum (Wani & Qazi, 2019). The study carried out by Sing et al. in 2018 showed a high level of stress prevalence among government nursing students and private college nursing students (Singh et al., 2018). However, when comparing the findings of the present study to other studies, it must be pointed out that the current study had a cohort of students following multiple study programs, and the mean age group of the sample was different from the other studies, where the present study surprisingly did not show a significant difference in perceived stress levels based on the socio-demographic factors assessed among the undergraduates of the HEI. However, the present study had a higher number of undergraduates from the lower year (first and second year) than the undergraduates from higher classes (third and fourth year). A plausible explanation could be that a higher number of first and second year undergraduates have not fully adopted the critical transitory period of young adulthood during university life. This could also explain the findings that show there was no significant difference in PS between study years among the students because the study lacked a balanced sample number from each year. A study done by Saat et al. showed that first-year students showed the highest mean stress score among the three study years, followed by the third year and second-year students. Nevertheless, according to his study, there was no significant difference in mean stress scores among study years showing comparability to the present study (Saat et al., 2010).

The present study revealed that there was no significant difference in PS between females and males and the mean perceived stress score was almost similar among both the groups. This shows that both female and male students experience an equal amount of stress in their university life. Similar findings have been reported by Saat et al. (Saat et al., 2010). But these findings contradict some of the past studies (Pariat ar al, 2014), which concluded that male students have a higher level of perceived stress compared to female students while some studies emphasized that female students have higher perceived stress than male students (Kashif et al., 2016; S. Kumar et al., 2013; Thawabieh & Qaisy, 2012). Moreover, Misigo et al. (2015) argued that both the female and male gender experience an equal amount of stress in their everyday life in terms of challenges,

social position, and the roles played by them (Misigo, 2015). This could perhaps explain the findings of the present study among female and male students.

Furthermore, the present study did not show any significant difference between the PS in students following different study programmes. These findings contradict other types of research, as mentioned above, which may be a result of the study environment being equal for all students. However, the sample size from each discipline has to be equalized to confirm this theory by further research.

The present study also aimed in finding the general self-efficacy levels where it was revealed that the majority of the students had a general self-efficacy level of 27, which is lower than the level reported from a previous study conducted among first-year medical students in India (V. Kumar et al., 2014). In the present study, the results indicated a significant association between the general self-efficacy and the residence and civil status. This suggests that students are affected by the place they stay, and personal problems related to the relationships.

The findings of the present study also revealed a significant negative correlation between perceived stress and general self-efficacy. Higher the perceived stress, lower the general self-efficacy among the participants in this study. Similar results have been observed in the studies done elsewhere, where high perceived stress has been associated with lower general self-efficacy (Moeini et al., 2008). Personal life factors influence the general self-efficacy of individuals, which in turn can become a contributory factor for stress. Further Interventional studies with a larger and representative sample are needed to find the specific factors contributing to lower self-efficacy.

As limitations of the present study, we can point out that the students may have under-reported their perception of stress and self-efficacy, as they may have felt expressing their thoughts and feelings in a university background unsettling although the anonymity of the self-administered questionnaire was maintained. Others might have over-reported their opinion on being stress and self-efficacy depending on life events and academic pressure. The differences in these perceptions can be ruled out to some extent since there was a large sample size of more than 300. Although the effects of these factors are negligible, future studies need to focus on the statistical power of calculating the sample size, and the proportionality of selecting the participants to the research.

In conclusion, stress was present in all students' majority being in the moderate stress level. Moderate stress was commonly prevalent among undergraduates irrespective of their gender and other socio-demographic factors. Nearly half of the undergraduate population studied had low general self-efficacy, which correlated negatively with perceived stress.

Recommendations

The necessary interventions to reduce perceived stress and increase self-efficacy can be implemented among the undergraduates. Further studies with enhanced sample proportions are needed to recognize the specific factors contributing to stress and self-efficacy among undergraduate students.

Acknowledgments

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Original Article

Inter-relationship between self-perceived body image, self-esteem and depression: Is self-esteem a mediator? A cross-sectional study among young adults

Jayawardane, M. H.[1]*, Ali Jinnah, S.[2]

[1]Department of Psychology, Faculty of Health Science, KIU, Sri Lanka

[2]Global Technological Campus, Kohuwala, Sri Lanka

Abstract

Self-perceived body image (SPBI) is the key to experience personal value and worthiness of oneself and has a significant influence on young adults' psychological functioning and well-being. Most researches on this area focused on adolescent girls. Therefore, this study sought to examine the mediation role of self-esteem with young adults' SPBI and depression. If self-esteem is found to be mediated the poor body image and depression, then the treatment can be focused more on self-esteem. In this cross-sectional study, a sample of 186 young adults (age: 18- 30 years) responded to a battery of questionnaires, which measured demographic information, self-perceived body image (measured by Appearance Schemas Inventory-Revised ASI-R), self-esteem (measured by Rosenberg's Self-Esteem Scale RSES), and depression (measured by Beck's Depression Inventory-II BDI-II). Data were analyzed using Spearman's correlation, multiple regression analyses, and simple mediation analyses. Self-esteem was tested as a mediator between SPBI and depression. Results revealed that SPBI is significantly correlated with both self-esteem (r=-.17, p<.05) and depression (r=-.17, p<.05). Self-esteem is also negatively correlated with depression (r=-.57, p<.001). Simple mediation analysis was conducted using self-evaluative salience (SES), and motivational salience (MS), subscales of appearance schema inventory-revised (ASI-R), and results indicated that the relationship between SES and depression was fully mediated through self-esteem, whereas MS was not significant to self-esteem nor depression. There was a significant gender difference in SPBI (p<.001). Self-esteem is recommended as a screening tool for young adults' body satisfaction and psychological well-being. Therefore, the findings of this study indicate that early attention to self-esteem will be beneficial in reducing the symptoms of depression and body dissatisfaction in young adults.

Keywords : Self-perceived body image, self-esteem, depression, young adults, cross-sectional study, Sri Lanka

Introduction

Self-perceived body image is the first impression that is formed in one's mind. It involves how individuals see themselves when they look in the mirror, how they feel about their body, what they believe about their appearance, and how they sense their physical attractiveness. It is well known that outer beauty is one of the first individual characteristics that is mostly concerned by oneself and noticed by others (Pop, 2016). Individuals' view of their body image reflects how well a person prizes, values, approves, likes, and thinks about themselves (Frost & McKelvie, 2004). A positive image of their body is viewed as an important reason to enhance self-esteem and it is strongly associated with improving physical and psychological well-being (Mellor et al., 2010). Therefore, it is clearly revealed that a poor view of body image has been related to a broad range of psychological conditions such as poor self-esteem, poor self-confidence, depression, distorted eating patterns, and obesity (Darby et al., 2007; Jackson et al., 2014). A significant proportion of young adults internalize their ideal body image and struggle with their body image perception. Even though the extensive academic researches explore the body image concept (Duchesne et al., 2016; Ra & Cho, 2017; Hamilton, 2008; Pisitsungkagarn et al., 2014; Grossbard et al., 2009; Brennan et al., 2010; Pop, 2016; Mellor et al., 2010) less research studies have been carried out to reveal the mediation role of self-esteem with SPBI among young adults. Indeed, the need for psychological and physical care for body dissatisfaction and eating disorders has greatly increased in preceding years (Brechan & Kvalem, 2014; Brennan et al., 2010; Mellor et al., 2010). This is because, physical attractiveness and physical changes related to body shape, weight, and appearance act as leading causes for young adults' psychological well-being, physical well-being, and social interactions (Ra & Cho, 2017). Everyone's ultimate goal is to achieve an ideal body image. Therefore, striving for the ideal body can lead young adults to disregard their physical needs and engage in unhealthy behavioral patterns. Therefore, it requires to focus attention on the aspects of body image and related problems.

Self-perceived body image is described as a personalized, multidimensional construct that embraces an individual's self-perception and evaluation of his or her physical appearance (Cash et al., 2004). Body image attitudes, evaluative thoughts, and beliefs of oneself have significant influences on their cognitive, behavioral, and emotional well-being. People who considered themselves as attractive often have more favorable attitudes towards themselves than those who considered themselves as unattractive. This is known as the "halo effect" (Thorndike, 1920) because individuals who are more attractive tend to think positively about themselves compared to less attractive individuals. This concept is also known as the "what is beauty is good" stereotype (Brennan et al., 2010). In our society, physical attractiveness is viewed as central for gaining a better place in the social setting since it would add a significant importance to positive self-esteem (Pop, 2016). Body image perception has a great place in self-worth, while body dissatisfaction has a great influence on both self-esteem and mood. Self-esteem is often defined as one's overall sensation of how worthy they are (Cherry, 2019). The evaluation of body image importance entails evaluations of self-worth, thus the inconsistencies between the real and ideal body image can be manipulated by controlling self-esteem (Mellor et al., 2010). For example, if an individual has negative attitudes towards his or her physical self, that person finds difficulty in accepting information that is opposing his/her beliefs. Likewise, if the individual has strong and positive attitudes, it is possible for him or her to accept the information which would reinforce his or her beliefs. Therefore, holding persistent negative beliefs may contribute to a lack of self-esteem by playing a central role in mental well-being. In present times, women's physical attractiveness often connects to attain a thin and attractive physical appearance, whereas, for men, it connects with a more muscular and mesomorph physique. Ideal appearance is often unattainable for average people, and therefore they become overwhelmed in coping with the disparity between real and ideal body image. Research studies have shown that body image incongruence has major issues that predominantly affect women (Brennan et al., 2010; Mellor et al., 2010; Duchesne et al., 2016). Consequently, dissatisfaction with their bodies seems to be higher in women compared to men, and they are more susceptible to value themselves lower and develop mood disorders (Brennan et al., 2010). Therefore, depression is one of the disturbances that closely link to body dissatisfaction. Major depression is the most severe form of depression, which may have the following symptoms: prolonged sadness, lethargy, loss of pleasure, changes in sleep and appetite, forgetfulness, poor self-worthiness, and suicidal thoughts (American Psychiatric Association, 2013). Therefore, the main purpose of this study is to gain a comprehensive understanding of the linkage between SPBI, self-esteem, and depression.

More specifically, the research was directed to achieve the following specific research objectives: to critically evaluate the inter-relationship between self-perceived body image, self-esteem, and depression to identify the mediation role of self-esteem between self-perceived body image and depression and lastly to compare the gender differences in young adults' perceived body image.

Methodology

A quantitative survey research method with a cross-sectional design was used in this study. This study consisted of young adults as a target population. The unit of analysis was young men (N=85) and women (N=95). Using G* power 3.1 version (Faul et al., 2009), a statistical power analysis was conducted to determine the sample size of this study, and it was determined that 115 participants were required to detect the medium effect ($f^2=0.15$) in the primary outcomes. A

total of 186 young adults participated in the current study, exceeding the minimum of 115 sample size. This list of young adults, age between 18 to 30 years served as the sampling frame for this study. The participants were selected from convenience sampling methods because of the conveniently available pool of respondents, proximity, and some eligibility criteria. Moreover, snowball sampling method was used to get the potential sample size. The eligibility criteria of this study were young adults who are literate, mentally stable, having no current medical diagnosis of body image disorders, and able to sign the informed consent form. A survey questionnaire was employed by 186 respondents on the sampling frame.

Data was gathered over three months from February to May 2018 using a battery of self-administered questionnaires. Before conducting the survey, from all participants, informed consent was obtained. Using an online basis and traditional paper-pencil method, the participants completed an assessment battery of three instruments and a demographic questionnaire. No incentives were given to participants to complete the questionnaire. All research procedures were approved by the Ethics Review Committee of Colombo International Institute of Higher Education and Coventry University regulations (ERC/BSPS18006).

Evaluation of self-perceived body image was assessed using the Appearance Schemas Inventory-Revised (ASI-R) (Cash et al., 2003), which is an extensive revision of Cash and Labarge's (1996) Appearance Schemas Inventory. Cronbach's alpha coefficient of the composite ASI-R scale of 0.90 is much similar to the previous reporting of Cash et al. (2003). Beck's Depression Inventory-II (BDI-II) (Beck et al., 1996) used to assess participant's depression, which is a revision of Beck et al.'s (1988) Depression Inventory. Cronbach's alpha coefficient of 0.89 is slightly lower than the value of 0.91 reported by Beck et al. (1996). Self-esteem was assessed using Rosenberg's (1965) Self-esteem Scale (RSES). Participants rated the extent to which they agreed with ten statements on a four-point Likert-type scale, ranging from 0 (Strongly Disagree) to 3 (Strongly Agree). Cronbach's alpha of RSES of 0.86 is closer to the previous study of Rosenberg (1965), showing satisfactory internal consistency.

Statistical Package for Social Sciences (SPSS) (Version 22) was used to examine the data. To ensure the eligibility of participants, a demographic information form was reviewed. The analysis procedure started with descriptive analysis, which examined the distribution, mean, median, and standard deviation of the scores for the variables. Spearman's correlations were computed to compare the correlation between SPBI, self-esteem, and depression. Subsequently, multiple linear regression analyses were performed to determine if any relationships existed. A simple mediation model, using PROCESS version 3.3 (Hayes, 2013), was conducted to verify the mediation effect of self-esteem between SPBI and depression.

Results and Discussion

Prior to the main analysis, the primary steps of statistical analysis were conducted. From the total of 186 final realized sample, only 180 were usable questionnaires because data from six of the participants were dropped from the study due to multivariate outliers. However, there was an adequate response rate of 97% for this study. All the completed questionnaires, therefore, were utilized to analyze. The sample consisted of young men (47.2%) and young women (52.8%) with an average age of 24.24 ± 2.73. The average weight and height for young women respectively were 56.48 kg ± 10.22 and 161.33 cm ± 9.16, whereas for young men were 74.84 kg ± 13.17 and 173.72 cm ± 8.81.

Multiple linear regressions were conducted to examine how SPBI and self-esteem can be used to predict depression. Prior to the analysis, the researcher ensured that regression met all five assumptions; linear relationship, normality, absence of multicollinearity, no auto-correlation, and homoscedasticity.

Table 1

Multiple Regression Results of Self-Perceived Body Image and Self-Esteem

Variables	B	SE	β	t	p
SES	-0.35	0.07	-0.48	-5.08	<.001
MS	0.29	0.07	0.39	4.15	<.001

Note: Measured self-perceived body image using subscales of ASI-R; SES & MS
$R=0.39$, $R^2=0.156$, $F=4.55$, $p<.001$

To test the relationship between SPBI and self-esteem, a multiple linear regression was conducted concerning ASI-R sub-scales of SES and MS as predictor variables and self-esteem as an outcome variable. Table 1 showed that both SES and MS were significant predictors of self-esteem, β= -0.48, t(179)= -5.08, p<.001 and β=0.39, t(179)= 4.15, p<.001 respectively. Therefore, the SPBI has a significant relationship with self-esteem was consistently supported by current findings. Predictive variables (SES and MS) of the Appearance Schema Inventory-Revised (ASI-R) were used to examine this association because that measures individuals' core beliefs about the importance, value, and efforts that one placed on their physical appearance (Cash et al., 2003). Supporting original findings of Cash et al. (2003), the current finding revealed that SES significantly predicted self-esteem with an inverse relationship while MS significantly predicted self-esteem with a positive relationship. That is when participants with higher SES tend to define themselves based on the beliefs they placed on their physical appearance. Their body image reflects how well they look and, how it feels and relates to their emotional experiences. The findings of this study supported the idea that the greater one concerns about their appearance, the more negatively they evaluate themselves (Rosenfield et al., 2006). Such self-evaluations are related insofar as they compare themselves with others and more likely to lower their self-esteem. Supporting Cash's (2011) cognitive-behavioral perspectives, these negative self-schemas are rooted as consequences of negative

self-evaluations, thus creating disruptive cognitive frameworks for physical appearance that directly impacts on individuals' self-esteem. However, those who are engaged in appearance-management (MS) behaviors to enhance attractiveness are not maladaptive as grooming behavior relates to achieving their actual self, which may boost their self-esteem. Thus, the more they are motivated to groom their behavior, the more they perceive their real self. Individuals who placed more value on managing appearance less likely to shatter their self-image. Consequently, their self-esteem may be unaffected or positively related to appearance-grooming behaviors.

Table 2
Multiple Regression Results of Self-Perceived Body Image and Depression

Variables	B	SE	β	t	p
SES	0.20	0.05	0.36	3.74	<.001
MS	-0.20	0.05	-0.35	-3.62	<.001

Note: Measured self-perceived body image using subscales of ASI-R; SES & MS
$R=0.38, R^2=0.144, F=4.14, p<.001$

To test the relationship between SPBI and depression, a multiple linear regression was conducted using SES and MS as predictor variables and depression as an outcome variable. Table 2 regression showed that these two variables were significant predictors of depression; SES, β= 0.36, t(179)= 3.74, p<.001 and MS, β=-0.35, t(179)= -3.62, p<.001. Results further supported that SES significantly predicted depression with a positive relationship, while MS negatively predicted depression. This means participants who are with higher SES tend to have a higher level of depression because their self-esteem often links with the negative beliefs about their physical appearance. Thus, it pointed out that disrupted self-image leads them to experience a significant amount of depression. Consistent with self-discrepancy theory, discrepancies between real and ideal self can be seen as failures, which may affect self-perception and self-esteem, causing them to experience emotional vulnerability, depression, and even suicides (Higgins, 1987; Kindrat, 2007). If they define their self-esteem based on their outer look (SES), the more likely they endure depression (Rosenfield et al., 2006). However, if the individuals attending to their appearance through appearance-grooming behavior (MS), the less they are to suffer from depressive symptoms. This is because, the act of grooming behavior relates to transforming their self-perceived selves into their actual selves, which may improve their perceptions of his or her body and reduce depressive symptoms. The negative relationship between MS and depression may be due to self-confidence and the ability to achieve the desired self. Thus, individuals with high MS levels are often found to be preoccupied with appearance-grooming behavior to achieve desired self. This explained that those who lack the beliefs about their ability to maintain SPBI are struggling with body image and depression.

Table 3
Linear Regression Results of Self-Esteem and Depression

Variable	B	SE	β	t	p
Self-esteem	-0.46	0.04	-0.58	-9.80	<.001

Note: $R=0.63, R^2=0.397, F=18.97, p<.001$

To examine the relationship between self-esteem and depression, a simple linear regression was conducted using self-esteem as a predictor and depression as an outcome variable. Table 3 regression analysis showed that self-esteem significantly predicted depression, β=-0.58, t(179)=-9.80, p<.001. As proposed by Beck's (1987) cognitive theory, self-esteem had a negative effect on depression. The findings further supported the fact that more self-conscious participants are found to be negatively evaluative of their appearance and directly link with depression. It is therefore clearly projected that depression and self-esteem are intertwined and contribute to negative moods. Supporting the cognitive-behavioral perspective, depression is rooted in lower self-esteem (Beck, 1987), and negative self-evaluations are the most proximate psychological contributors to weaken self-esteem (Brennan et al., 2010). Thus, the more individuals dissatisfied with their body image, the more they experience weakened self-esteem and depression. Furthermore, cognitive theories of depression explained that negative evaluations are crucial for depression (Beck 1987), therefore self-esteem and depression are closely related even though depression can be caused by more than one thing.

Table 4
Total, Direct, and Indirect Effect of Self-Perceived Body Image (SES and MS) on Depression (Mediated via Self-esteem)

Path	Total effect	Direct effect	Indirect effect
SES ---▶ DEP	0.079 (.075)	0.0008 (.983)	0.078 [0.015, 0.141]
MS ---▶ DEP	-0.070 (.122)	-0.0405 (.270)	-0.029 [-0.088, 0.029]

Note: Measured self-perceived body image using subscales of ASI-R; SES & MS
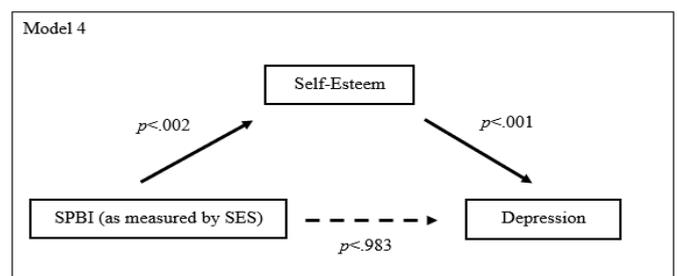SES= Self-Evaluative Salience, MS= Motivational Salience, DEP=Depression

Fig. 1. – Mediation Role of Self-Esteem between Self-Perceived Body Image (as measured by Self-Evaluative Salience) and Depression

Two simple mediation analyses were conducted to test the mediation effect of self-esteem in the relationship between SPBI (using the subscales of ASI-R; SES, and MS) and depression (Table 4). Results showed that SES negatively predicted self-esteem, β=-0.16, t(179)=-3.01, p=.002, and self-esteem negatively predicted depression, β=-0.46, t(179)=-9.52, p<.001. The direct path from SES to depression was not significant in the presence of self-esteem. Results further revealed that the indirect effect was significant (indirect effect=0.0786, SE=0.0318, CI [0.0158, 0.1418]), confirming the mediation role of self-esteem. Therefore, self-esteem fully mediated the relationship between SPBI (as measured by SES) and depression. Dysfunctional body image attitudes (SES) predicted depression only in the presence of self-esteem. Therefore, those who are with stronger dysfunctional attitudes towards their physical appearance affects lowering self-esteem, which in turn affects depression. Although dissatisfaction is important, meaning placed on appearance is pivotal for one's sense of self. Thus, negative self-evaluations are the true mediator for depression. Poor view of body image leads to a preoccupation with self-perceived flaws, and this could be the underlying mechanism for lowering self-esteem and provoking depressive affects. Unlike SES, MS was not a significant predictor of self-esteem (β= 0.06, t(179)=1.10, p=.269) nor depression (β=-0.04, t(179)=-1.10, p=.270). Therefore, the mediation effect of self-esteem was not significant between MS and depression (indirect effect=-0.0298, SE=0.0297, CI [-0.0884, 0.0291]). Since MS and depression were not mediated by self-esteem, further research needs to clarify this association.

The gender difference in SPBI was assessed using an independent sample t-test. The t-test was statistically significant, as the female group (M=3.36 ± 0.65) was significantly different, 95% CI [-0.492, -0.137], to male group (M=3.05 ± 0.53), p<.001. Dysfunctional body image attitudes are prominent among young women; therefore, they are more prone to experience negative body schemas, depression, and anxiety (Brennan et al., 2010). The results, therefore, confirmed the final objective as there was a significant gender difference in the way they view their body image. In line with past research, women are more vulnerable to experience negative body-schemas in more situations than young men, therefore they are more disposed to suffer from body dissatisfaction (Brennan et al., 2010; Grossbard et al., 2009). Further, gender differences are may due to the level of internalization of sociocultural appearance standards as women are more susceptible to the effect of social pressure associated with physical appearance (Brennan et al. 2010). Perhaps, men have more realistic expectations to achieve the male masculine ideal, while women engage in more unrealistic expectations to achieve the thin ideal (Mellor et al. 2010). Limitations of the present study include the fact that the findings are based on non-probability samples, thus limit the generalizability of findings and limit making inferences about populations. Therefore, future research should consider random sampling

to validate the findings. Furthermore, the present study examined the mediation role of self-esteem between SPBI and depression. Future research studies, therefore, need to be directed to identify the other psychological factors that mediate the relationship between SPBI and depression.

Implications

This study supports the existing literature, showing the vital role of self-esteem as a mediator between the relationship of SPBI and depression. The study may also contribute to understand the relationship between SES and MS with self-esteem and depression while stressing that SPBI varies somewhat and may not the same for men and women. Supporting self-concept theory (Craven & Marsh, 2000) and domain theory (Brechan & Kvalem, 2014), findings of the present study suggest that treatments for body dissatisfaction should be more focused on self-esteem rather than dysfunctional self-attitudes. Since it explains that body dissatisfaction influences the self-esteem of young adults, self-esteem can be targeted through body dissatisfaction. Understanding the real association may help clinicians to focus on true causes and decide the best therapeutic approaches for those who present depression. Since depression is the most prevalent mental illness in the world, findings from this study may offer clinicians to target more on SES and MS in treatments. For instance, by understanding that a high level of SES is linked to lowering self-esteem, clinicians may examine the causes for SES and recommend healthy behavioral interventions targeting the predictors of SES. Further, concerning the linkage of MS, it is therefore recommended to implement behavioral plans related to appearance management as it relates to enhance the actual self, which may increase self-efficacy. Since the results of this study confirmed the mediation role of self-esteem, the increase, and early attention on self-esteem may be warranted.

Conclusion

The findings from the current study confirm the existence of a relationship between SPBI, self-esteem, and depression, whereby the linkage between SPBI and depression can be explicated through self-esteem. Interestingly, this study found that the more participants described their self-esteem concerning their physical appearance, the more they shatter their self-esteem and experience depressive symptoms. The findings of the study further explained that attending, appreciating, and managing one's physical appearance may not always involve maladaptive appearance management behavior, but the investment in dysfunctional beliefs of one's body considerably affect one's life as it is central for one's sense of self-worth. Due to the dysfunctional body image attitudes, as well as sociocultural appearance standards, the findings may suggest that young women are more prone to experience negative body schemas, anxiety, and depression. Therefore, these findings may provide directions to researchers and clinicians to focus more on self-esteem.

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Original Article

Factors Associated with Chronic Kidney Disease of Unknown Aetiology among the Patients who Seek Treatment from the Nephrology Clinic of General Hospital –Vavuniya

Athy K.,[1] Thissera J. H. N. U. K.[1], Fernando A. R. V.,[1] Jayamaha A. R.,[2] Samarakoon D. N. A. W.,[1]* Siriwardhene M. A.[3]

[1]Department of Biomedical Science, Faculty of health science, KIU,

[2]Department of Nursing, Faculty of Nursing, KIU,

[3]Department of Pharmacy and pharmaceutical sciences, University of Sri Jayewardenepura.

Abstract

Chronic Kidney Disease of unknown aetiology (CKDu) is one of the major health care problems in Sri Lanka. This community-based case-control study was conducted to identify potential causes of CKDu. The study also designed to identify suspected CKDu causative based on social-cultural factors and water quality parameters among the patients who sort treatment from the General Hospital (GH), Vavuniya Nephrology Clinic.

The case group consisted of 106 patients who have CKDu and sort treatment from the nephrology clinic at GH Vavuniya. The control group consisted of 100 people who willingly participated and lived in the vicinity of the patient houses, and had not reported kidney disease (confirmed by screening program of CKD unit). The water samples were collected from their drinking water source which was used for more than five years before having diagnosed with CKDu.

The data was analysed using chi-square with cross-tabulation. On the comparison between the CKDu group and the control group, a significant correlation was observed for smoking "Beedi", engaging in farming, low level of education, and exposure to weedicides. In the analysis of water quality parameters, colour and electrical conductivity were elevated. However there was no single water quality parameter that could clearly and directly be related to the aetiology of CKDu, however, it was found that the colour, and electrical conductivity of water samples were higher than that of WHO recommendations.

Keywords : *CKDu, Water quality parameters, Social and cultural habits, Weedicide.*

Introduction

Chronic kidney disease of unknown etiology (CKDu) was first reported in 1994 among paddy farmers in the Padaviya farming area in the North Central Province (NCP) of Sri Lanka (Jayasumana et al., 2013; Jayasumana et al., 2013). Twenty years after the first report, CKDu is one of the major health concerns in Sri Lanka today, with more than 50,000 estimated patients in the North Central province, and spreading on an epidemic scale to other farming areas in the Northern, North-Western, Central, Uva and Eastern provinces of the country (Redmon et al., 2014). Previous studies, indicated that the incidence of CKDu in Sri Lanka has been doubling every four to five years so that currently more than 150,000 people are affected by the disease and about 3% deaths are reported annually (Wimalawansa & Wimalawansa, 2014). The high cost involved in the management of end-stage renal failure has led to a substantial burden on health care resources.

It is a hypothesis that CKDu in Sri Lanka maybe associated with environmental factors (Gunatilake, Samaratunga, & Rubasinghe, 2014). CKDu in Sri Lanka may be attributed to irrigation work and fertilizer runoff from agricultural regions. Dharmawardana et al., 2014, suggested that CKDu may be due to pollutants and toxins ingested from food, direct ingestion of toxins when handling agrochemicals, and prolonged exposure to toxins and pollutants from drinking water (Dharmawardana, Amarasiri, Dharmawardene, & Panabokke, 2015). It was further proposed that prolonged consumption of drinking water with high ionicity affects the kidney membrane adversely. There are several examples to support these suggestions. The Cadmium toxicity of people living in the Jinzu river basin, Japan, in the 1950s was due to a commercial discharge from mine contaminating water used for drinking and due to irrigation of paddy (Wanigasuriya, 2012). Chinese herbal nephropathy which is a form of intestinal nephritis was first reported in 1994 and Belgium women who had undergone slimming therapy with Chinese herbs containing aristolochic acid presented with interstitial nephritis. The Balkan endemic nephropathy (BEN) which was first described in 1956 was found to be associated with dietary exposure to aristolochic acid (AA) which caused cancer (Wanigasuriya, 2012).

Epidemics of CKDu are also reported in other different regions of the world, including areas of India and Central America (Agampodi, Amarasinghe, Naotunna, Jayasumana, & Siribaddana, 2018)

Similar issues were identified among rice farmers in Sri Lanka. Further a similar disease condition was reported among sugarcane plantation workers in Nicaragua and El Salvador in Central America. Both diseases demonstrated clinicopathological similarities and are also referred to as Chronic Interstitial Nephritis in agricultural communities (CINAC) (Jayasumana et al., 2017). More recently similar forms of CKDu have been identified in Andra Pradesh in South India (Ruwanpathirana et al., 2019).

This study aims to asses the parameters which affect the CKDu in Vauniya and to asses the water quality parameters that might have had an impact on CKDu.

Methodology

Study Design

This study was a case-control study conducted in the Vavuniya district. 350 patients attending the Nephrology clinic of GH Vavuniya receiving treatment for CKDu were enrolled in the study. Informed consent was obtained from each participant who volunteered to participate after explaining the nature of the study.

Study Population and Sampling Method

For the study 106 patients were randomly selected from 350 CKDu patients. Water samples were collected from home visits of all 106 patients. One hundred people who volunteered and lived in the vicinity and had not reported kidney disease were selected as the control group, (Confirmed by screening program of CKD unit).

An interviewer-administered questionnaire was used to collect information on demography, health status, details of the drinking water source, food habits, etc.

Sample Size

The sample size was calculated by Kelsey formula for case-control studies in OpenEpi software version 3.1 with α = 0.05, power = 80, the ratio of cases to controls = 1.0, the hypothetical proportion of exposure among controls = 50, and an odds ratio (OR) of 2 as a minimum difference between groups to be detected.

Inclusion criteria

Patients with CKDu who sort medical treatment from GH Vavuniya, (where most of the CKDu patients live in North and North-Central Province)

Exclusion criteria

CKDu due to, diabetes type 1 and 2, hypertension, immune system diseases (Lupus nephritis), long-lasting viral illnesses, such as HIV/AIDS, hepatitis B, and hepatitis C, pyelonephritis, urinary tract infections, polycystic kidney disease, congenital defects of kidneys, drugs/ toxins,/ lead poisoning and long-term use of some medications including NSAIDs (nonsteroidal anti-inflammatory drugs)

Study Instrument

The questionnaire and data collection sheet were used as the study instruments. Parameters of the water samples were measured using water analyzer DR6000. The water quality parameters such as, pH, total dissolved solvent (TDS), electrical conductivity, and turbidity were measured using the respective meter

Sample collection and preparation

Water samples of the drinking water source of each participants (which have been used for more than 5 years before being diagnosed with CKDu) were collected into

1000ml volume plain, plastic bottles, and sent to the laboratory without delay (without any preservatives). The water samples were analyzed within six hours after collection.

Ethical Clearance

Ethical approval for the study was obtained from the ethics review committee of KIU (KIU/ERC/18/048). Further approval was obtained from the Director of the Vavuniya General Hospital.

Results and Discussion

In the CKDu population 85 (80.2%) were males and 21 (19.8%) were females compared to the control group with 68 (86%) males and 32 (32%) female. Majority of the CKDu and control population were married (102, 96.2% and 90, 90% respectively). The median age of both groups was 60 years.

Majority of the CKDu population had attended school up to grade 8 (52, 49.1%) but only two individuals had studied up to postgraduate level. Similarly, three individuals in the control group had also possessed postgraduate qualifications. There were no drastic differences between the education level among test and control group (Table 1).

Table 1- Education level in the test and control group

Educational level	CKDu group (n=106)		Control (n=100)	
	Number	%	Number	%
No schooling	19	17.9	6	6
Up to grade 8	52	49.1	42	42
Up to O/L	29	27.4	23	23
Up to A/L	4	3.8	16	16
Graduate	0	0	10	10
Post Graduate	2	1.9	3	3

When the occupations of the individuals enrolled in the study were investigated, it could be observed that majority of the CKDu population were occupied in farming (26, 24.5%) and in agricultural labouring (26, 24.5%) (Table 2).

Table 2- Occupations of test and control groups

Socio Demographic Factor	CKDu group (n=106)		Control (n=100)	
Occupation	N	%	N	%
Farmers	26	24.5	20	20
Agricultural labourer	26	24.5	12	12
Businessmen	6	5.7	12	12
Management Assistant	9	8.5	6	6
Teachers	0	0	11	11
Housewife	9	8.5	25	25
Fishermen	1	1	4	4
Other occupation	38	35.8	10	10

Out of 106 CKDu patients, 52 had occupations related to farming (Farmers and agricultural laborors). The results of the chi square test showed that there is a significant association between CKDu and occupations associated with farming (p=0.001).

Table 3. Association of CKDu with behavioural and enviromental factors

	CKDu		Control		P value
	Yes	No	Yes	No	
Smoking beedi	18	88	2	98	<0.001
Consumption of alcohol	16	90	13	87	0.693
Chewing betel	17	89	17	83	0.852
Exposure to weedicides	21	85	0	100	0.001

Using weedicides and smoking beedi have also shown significant association with CKDu (table 3). Exposure to weedicide maybe prevalent in individuals who have occupations associated with farming which maybe one of the reasons that farming shows a significant association with CKDu.

Studies conducted to determine the causative factors of CKDu have reported that agrochemicals maybe one of the leading factors in the development of this disease. (Jayasumana et al., 2013; Jayatilake, Mendis, Maheepala, & Mehta, 2013; Peiris-John, Wanigasuriya, Wickremasinghe, Dissanayake, & Hittarage, 2006). Further Jayasumana et al., (2013) also reported that pesticides and fertilizers which are excessively used in paddy farming may be a likely source of arsenic in CKDu patients in the study area (Jayasumana et al., 2015; Jayasumana et al., 2013). However Ruwanpathirana, in 2019, revealed that particular exposures associated with farming (e.g. pesticide exposure, heat exposure) did not appear to explain the increased risk of CKDu, due to limited available information (Ruwanpathirana et al., 2019). Thus the reasons for high CKDu prevalence still remains an enigma.

There are very few number of research published on beedi consumption and associated health risks in Sri Lanka. A report published by Alcohol and Drug Information Centre in 2014 has identified beedi as a cheap form of tobacco with a large consumer base mostly in rural areas (ADIC, 2014). However the risks assorciated with beedi consumption has not been properly investigated and the government restriction on cigarattes may have increased the consumption of beedi (Gunasinghe, 2018). Smoking beedi maybe a habitual behavior of some individuals involved in farming, however more research maybe needed to identify the underlying risks which may relate to the development of CKDu.

The water quality parameters measured from the water samples collected from the water sources used by the CKDu patients and controls are mentioned in table 4. The average of the most water quality parameters did not exceed the WHO recommendation and national recommended values in any of the sampling groups. However, the colour of the water sample and electrical conductivity were elevated compared to the standards. Therefore, further research should be carried out to find factors affecting the colour of the water samples and electrical conductivity.

Table 4-Summery water quality parameters.

Water quality parameters	Mean (CKDu)	Mean (Control)	SLS 614: 2013 recommendation	WHO Recommendation
Colour (Hazen)	20.11	16.43	15	2
Turbidity (NTU)	0.49	0.54	2	<1
pH at 25^0C	7.08	7.1	6.5 - 8.5	6.5–8.5
TDS (mg/L)	488.21	464.78	500	1,000
NO_3 (mg/L)	1.52	1.33	50	50
NO_2 (mg/L)	0.04	0.03	3	3
F^- (mg/L)	0.34	0.45	1	1.5
PO_4^{-3} (mg/L)	0.59	0.63	2	-
Fe (mg/L)	0.10	0.06	0.3	0.1
SO_4^{-2}(mg/L)	36.17	32.28	250	
Electrical conductivity($\mu S/cm$)	979.22	891.54	<400	

Conclusion

Occupations associated with farming maybe at a higher risk of developing CKDu in the study population. Factors that may also contribute to the risk of developing CKDu maybe the use of weedicides and habit of smoking beedi.

The quality of water may also affect the development of CKDu but further investigations maybe needed to isolate the specific parameters.

Future recommendations

It is recommended to conduct further surveys in other districts of the country using the same protocol to study the prevalence and causative factors of suspected CKDu for better understanding.

Due to the limited facilities available, samples had to be analysed only for a few chemical parameters. But it is important to study further water quality parameters of the water samples from several areas of the country.

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Conflicts of interest.

There are no conflicts of interest.

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