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Role of Digital Planimetry in Wound Management

Gnaneshvar Manivannan[1], Neljo Thomas[2], Ravi Kumar Chittoria[3]

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Abstract

Wound measurement and keeping track of wound healing are considered a routine part of wound management. Wound measurement is a non-standardized, variable process that can introduce errors by as much as 40%[1] and suffers from inconsistency. Even with considerable advances in technology, wound measurement in clinical practice today is still mostly a manual process with wounds most often measured using rulers and probes that while simple is not accurate, consistent or efficient, and often carry the risk of infection. In this article, we will discuss the role of Digital Planimetry in wound measurement.

Keywords: Digital Planimetry; Wounds; Assessment.

INTRODUCTION

The measurement of the size of the wound helps in deciding the further course of management of wounds. It was shown that change of wound surface area over time is a good predictor of wound healing and in the treatment of patients with diabetic foot ulceration, there is a recommendation to re-evaluate the clinical procedures if the wound does not reduce its area by more than 40% in 4 weeks.[2] In wound cases,the ultimate goal is to prevent infections and other complications and also to hasten wound healing. It is important to understand the pathological process of wound development in the patient for planning the treatment for the specific wounds. The detailed clinical examination should include history and duration of ulcer, associated comorbidities, examination of the ulcer along with the specific radiological investigations of the patient. There are various methods by which wounds can be measured like a photographic record, comparison, ruler method, graph method, and digital planimetry. In this article, we will assess the usefulness of Digital Planimetry (Fig. 1) in measuring the area of the wounds.

Author's Affiliation: [1]Junior Resident, Department of General Surgery, [2]Senior Resident, Department of Plastic Surgery, [3]Professor & Head of IT Wing and Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research Pondicherry 605006, India.

Corresponding Author: Ravi Kumar Chittoria, Professor & Head of IT Wing and Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research Pondicherry 605006, India.

E-mail: drchittoria@yahoo.com

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Fig. 1: Digital Planimetry for wound measurement

MATERIALS AND METHODS

This is a case report of the use of digital planimetry in a venous ulcer wound. This study was conducted in a tertiary care hospital in 2022. The Patient was 50 years female who presented with an ulcer on her left leg for five years. The ulcer was 18 x 10 cm, with, the floor was covered with necrotic tissue. There was no history of any co-morbidity. The patient was thoroughly investigated, and it was found that the patient had an incompetent venous perforator in the middle third of the leg. The method of wound area measurement using Digital Planimetry is easy to perform and inexpensive. The wound is photographed with a ruler or a marker grid (Fig. 1) of known dimensions placed at the skin near the wound edge and the image is transferred to a computer and opened in planimetric software (ImageJ software).

Step 1: The wound was cleaned to define the surroundings.

Step 2: A sterilized grid of a 4×4 cm area was kept along the side ofthe wound.

Step 3: Good quality photograph was taken and saved to thecomputer. The photograph was analysed using ImageJ free opensource software.

Step 4: The edges of the wound were marked and the area wascalculated. As the area of the grid known i.e., 16cm^2 the numberof pixels falling under the square marked and marked wound wascalculatedArea of wound=16 (wound measurement/grid measurement)[3] (Fig. 2)

Fig. 2: Digital Planimetry software calculating the surface area of the wound

RESULTS

The ruler method which is routinely used in clinical practice was highly inaccurate and overestimated the wound size by nearly 50%. However Digital planimetryremained consistent and accurate with the percentage of over or underestimation being 2-4% in comparison with it.

DISCUSSION

The results of the current study indicate that the use of digital planimetry efficiently improves the accuracy and precision of area measurement. The use of digital planimetry remarkably reduces the variation of area measurement by averaging the number of pixels per 1 cm from two sides of the measured wound. A square paper marker placed near the wound and photographed with it was used by Shetty et al[6] for calibration in wound area measurement. They proposed using the number of pixels per 1 cm^2 for calibration, which could be determined from the number of pixels in the 16 cm^2 square. Unfortunately, the use of only one square marker at one side of the wound is almost the same as using one ruler for calibration at one side. Two squares placed at opposite sides of the wound would help much more, but they did not suggest such a technique. The technique with one square marker was not compared with the standard technique based on one ruler commonly used for calibration and the possible superiority of calibration with a square marker was not confirmed. Based on the results of the current study one can conclude that digital planimetrywill be the best method, of all presented in this study, for small wounds and for wounds placed in skin regions with low curvature. The other methods presented here will have better accuracy on curved skin, but they are also not suitable for all cases. There are regions of skin where the wound area measurement is always problematic. For example, a large wound around the heel will cause problems, because the transparent film used in the Visitrak device and in the area me method will not cover properly such a region and the wound tracing will be made with errors. Measurement at heal with the Silhouette Mobile device will be also problematic as it requires some region of healthy skin in order to properly compensate for the skin curvature. Every non-3D method in such a region will measure the area with a certain approximation.

CONCLUSION

Digital planimetry appears to be appropriate means of obtaining accurate surface area measurements. Digital planimetry is a quick and practical method and could therefore be recommended in the clinical setting.

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First Aid Knowledge among Health Assigned Teachers of Primary Schools: A Literature Review

Abhay D Pattan[1], Divya B Chauhan[2], Praful S Damor[3], Milankumar J Chauhan[4]

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Abstract

Background: Every parents of a child knows that it is hard enough to keep their child safe at home but when child goes off to school there is a whole new set up of challenges. Parents totally entrust their children to the schools. They rely on the teachers as their second parents in the institute for learning. They know for a fact that their educators will want no harm to come their way. While they are busy working, they fully believe that their children are well cared for. On the other hand, the teachers have the responsibility to keep an eye on their students. They should make sure that they are comfortable and secured within the four walls of their school. This then calls for their ability to handle even the most stressful situations. So much more, the school staff, especially the health teacher has to be equipped with the knowledge of first aid.

Keywords: First knowledge; Health assigned teachers; Primary schools.

INTRODUCTION

According to national first aid science advisory board, first aid should be learned by every person, for this it is necessary, that first aid training and education should be provided to everyone or universal.[1,2] In childhood, school life plays an important role for everyone. It has a great or direct impact on children's physical and mental development.[3] As the children comes under the vulnerable group; they are more prone to get injuries and accidents especially when they are in school going age because at that time they are still maturing physically and mentally. In school, teachers are the first caregiver who protects the children from trauma and accidents. Every teacher should have the ability to deal with any health emergency condition, when a children need health care. The victim should get immediate management of any accidents or trauma for good and early prognosis. Every time, health worker would not be available in the school or place where accidents had taken place consequently. It is needed or desired that there should be Health Assign Teacher in every schools who will be responsible to look after the minor ailments or accidents in the school.[4] Students' safety is a major concern for teacher, parents and school staff. In some countries health education is a subject in its own right under the responsibility of health education teachers (e.g. Finland,

Author's Affiliation: [1]Associate Professor, [2]2nd Year M.Sc Nursing Student, [3,4]Assistant Professor, Parul Institute of Nursing, Parul University, Vadodara 391760 Gujarat, India.

Corresponding Author: Abhay D Pattan, [1]Associate Professor, Parul Institute of Nursing, Parul University, Vadodara 391760 Gujarat, India.

E-mail: abhay.pattan@gmail.com

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Ireland), while in others, it is cross curricular in implementation, covered across a broad spectrum of subjects.[5] Ideally, health education would occur within a broader framework of a Health Promoting School (HPS). The HPS framework is a specific approach that is used across countries for promoting health in the school setting. It is a whole school approach aimed at enhancing the health and educational outcomes of students. There are typically six components of the HPS approach; (1) Healthy school policies (2) The school's physical environment (3) The school's social environment (4) Individual health skills and action competencies (5) Community links (6) Health services.[6]

OBJECTIVES

The Objectives of this study was to systematically review the literature to

- The literature reviews' would be easily accessible.
- It is related to the study and will be helpful in my further study.

Inclusive and Exclusive Criteria

Inclusive

- Reviews' after 2001 have been selected in review.
- Studies selected from PubMed, Cinhal, Medline.
- Full article related to first aid management.

Exclusive

- Short article has been removed.
- Duplicate articles have been removed.

METHOD

In present study non experimental descriptive survey design was used. The population under study was Health assigned teachers working in selected schools of Bhaniyawala, Doiwala and Ranipokhri of Dehradun city within 10-15 km of distance from Jollygrant. Non probability Purposive sampling technique was used. 40 samples were selected for the study who were health assigned teachers both male and female in the selected schools of Dehradun city.

MATERIAL AND METHOD

PubMed, Research gate, Google scholar database were used to search the literature, Studies were included only if the data on prevalence of oral hygiene were available.

DATA AND SOURCES OF DATA

Literature search

A literature review search was carried out in the following electronic bibliographic databanks: Medline/PubMed and the Google Scholar, included all publications up to September 2019. Search words collected of prevalence and affected by the oral hygiene for all years. Restriction based on 2000 JAN to September 2020 publication year.

Design: A literature review

RESULTS AND DISCUSSION

Six full text articles met the inclusion criteria are involved in the literature review's the literature review revealed that the majority of health assign teachers were having average knowledge about first aid i.e. 29 (72.5%) and 10 (25%) were having good knowledge and 1 (2.5%) was having poor knowledge regarding first aid. Majority of participant were female 21 (52.5%). The educational status of most participants was post graduate (67.5%). Majority of the schools were private 25 (62.5%). There is no significant association between sociodemographic variables i.e. Gender, level of schools, year of experience as a health assigned teacher and education provided by teacher, but qualifications of teachers and type of schools was found to have a significant association.($p > 0.05$).

Literature review suggest that these are few factors influencing the prevalence such as age, socio economic condition and working experience, gender, vaccination. Study done in Dehradun city, the majority of health assign teachers were having average knowledge about first aid. Another study by Nitin Joseph reveals that Only 69 (47%) teachers had received first aid training previously. Poor and moderate knowledge of first aid was observed, Another study done by Rajendra Kumar Sharma[3], 2019 reveals that that the respondents had higher attitude as compared with knowledge and practice score in the first aid and emergency care. In Nigeria the studyrevels that Mean first

aid knowledge scores for intervention drivers were 48.9% (SD=12.0), 57.8% (SD=11.2), and 59.2% (SD=9.0) at baseline, immediate, and three months post-intervention. A quasi-experimental study in secondary schools shows that Results showed significant differences in self-reported knowledge scores at twelve months follow-up. A study done in pre hospital trauma setting Vienna shows the results a total of 2812 cases were documented. The most frequent causes of trauma were falls from heights less than 1 meter (50%) and traffic accidents (17%). A qualitative study done in Tanzania reveals the three themes emerged from the analysis. The theme "Maintain safety while saving injured victims' lives and facilitating access to a health facility" was comprised of safety, sorting, initial help, and assisting access to hospital care.

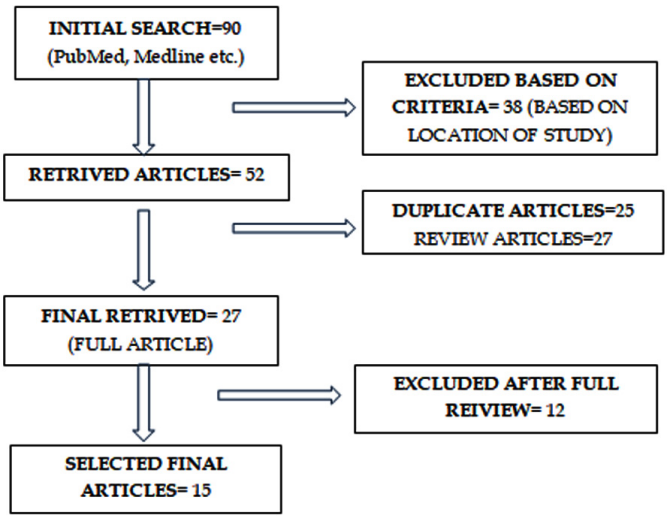

Fig. 1: Flow Chart

Study No	Author detail with year of publication	Region of study	Study design	Study sample	Period	Gender	Major findings
1	Rakhi Pandey, Richa Chauhan, Sushant Dobhal, Swasti Dabral, Swati Nathani, Sweety Negi, Umesh Rana, Vaishali Negi, Varsha Maindola, Vishal Rawat, Dipti Y. Sorte, Rashmi Bharadwaj[2]	selected schools of Dehr-adun city	Non-experimental survey study	40-Health assigned teacher		40 - Health assigned teacher	Result shows that the majority of health assign teachers were having average knowledge about first aid i.e. 29 (72.5%) and 10 (25%) were having good knowledge and 1 (2.5%) was having poor knowledge regarding first aid. Majority of participant were female 21 (52.5%). The educational status of most participants was post graduate (67.5%). Majority of the schools were private 25 (62.5%). There is no significant association between socio demographic variables i.e. Gender, level of schools, year of experience as a health assigned teacher and education provided by teacher, but qualifications of teachers and type of schools was found to have a significant association. (p> 0.05). (Pandey R, 2017).[1]
2	Nitin Joseph[2,9] MBBS, MD (Commun Med), PGDip (Family Med); Thanneermalai Narayanan; Saifuddin bin Zakaria; Abhishek Venugopal Nair; Lavina Belayutham; Aathiya Mihiraa Subramanian; K G Gopakumar MBBS, MD (Pediatrics)	selected schools of Mangalore, South India	Cross-sectional study	146 - school teachers		146 - school teachers	Only 69 (47%) teachers had received first aid training previously. Poor and moderate knowledge of first aid was observed among 19 (13%) and 127 (87%) teachers, respectively. Only eight teachers knew the correct procedure for cardiopulmonary resuscitation. Most teachers 96 (66%) were willing to administer first aid if provided with the required training. A total of 74 teachers reported having practised first aid in response to a situation arising at their school. Wounds (36%) and syncopal attack (23%) were among the commonly encountered situations requiring first aid management at schools. Teachers' confidence level in administering first aid was significantly associated with prior training in first aid (p=0.001). First aid kits were available in only five of the nine schools surveyed.

3	Rajendra Kumar Sharma	Selected Primary Schools at Yamuna Nagar	Non experimental descriptive design	20 - school teachers	14-06-2019z	20 - school teachers	The finding shows that the mean knowledge score of respondents found to be 60.25 percent and SD value as 9.65. The overall mean attitude score of respondent found to be 60.41 percent and SD value as 5.10. It can be concluded that the respondents had higher attitude as compared with knowledge and practice score in the first aid and emergency care. Further, the overall mean practice score of primary School teacher's found to be 53.12 percent with the SD value as 3.46 in the first aid and emergency care. Overall findings reveal that the primary school teachers had moderate knowledge, adequate favourable attitude and moderate practices regarding first aid and emergency care.
4	Adesola O Olumide[41], Michael C Asuzu[1], Oladele O Kale[2]	South West Nigeria	Quasi experimental study	128 commercial drivers		128 commercial drivers	Mean first aid knowledge scores for intervention drivers were 48.9% (SD=12.0), 57.8% (SD=11.2), and 59.2% (SD=9.0) at baseline, immediate, and three months post-intervention. Corresponding scores for the controls were 48.3% (SD=12.8), 39.2% (SD=15.3), and 46.8% (SD=15.3). Mean first aid skill scores for intervention drivers were 17.5% (SD=3.8), 80.7% (SD=8.3), and 72.3% (SD=16.8). Scores for control drivers were 16.5% (SD=4.5), 16.3% (SD=4.7), and 20.4% (SD=9.1), respectively. Repeated measures ANOVA showed significant differences in first aid knowledge and skills scores over the three phases. Independent t-test revealed significant differences in scores between the intervention and control groups post-intervention.
5	Bianca Reveruzzi[1], Lisa Buckley[2], Mary Sheehan[3]	In secondary schools	a quasi-experimental design	1942 - students	Aug 6 2020	1942 - students	Results showed significant differences in self-reported knowledge scores at twelve-month follow-up (controlling for baseline knowledge). Students in the SPIY group and the treatment-as-usual first aid group had higher total scores than the control group. Teachers and students reported positive perceptions to first aid study, in particular the interactive delivery and scenarios for contextualizing information. Practical Applications: The study provides support for the retention of first aid knowledge up to 12-months and thus the inclusion and feasibility of first aid training in secondary school curriculum.
6	Walter Mauritz[6] 1, Linda E Pelinka, Alfred Kaff, Bernhard Segall, Peter Fridrich	prehospital trauma setting-Vienna	A prospective, epidemiologic	2812 cases	Oct 31, 2003	2812 cases	A total of 2812 cases were documented. The most frequent causes of trauma were falls from heights less than 1 meter (50%) and traffic accidents (17%). The most frequent injuries were injuries to the extremities (59%) and head and traumatic brain injuries (42%). Most patients were "moderately" or "severely" injured (69% and 29%, respectively), but life-threatening injuries were rare (2%). Bystanders were present in 57% of the cases. The most frequently required first aid measures were "application of a dressing" and "positioning" of the patient. "Control of haemorrhage", "ensuring accident site safety" and "extrication" of the patient were less frequently required. "Clearing of the airway", "precautions against hypothermia" and cardio-pulmonary resuscitation were very rarely required.
7.	Gift G Lukumay[7] 1, Anne H Outwater 2, Dickson A Mkoka 3, Menti L Ndile 3, Britt-Inger Saveman4	Tanzania	A qualitative study	41 participants	Oct 11, 2019	41 participants	Three themes emerged from the analysis. The theme "Maintain safety while saving injured victims' lives and facilitating access to a health facility" was comprised of safety, sorting, initial help, and assisting access to hospital care. "Overwhelmed working with limited resources and support" included limited care and transport resources, police fatigue, and little or no support.

Table Conti...

							"Improving supportive system and empowering frontline personnel" included the need for an emergency care system, availability of resources and an emergency medical support system, and training for police and drivers regarding victims' first-aid care, and road safety.
8	H K Bakke 1, H K Bakke, R Schwebs	Primary and secondary school	a quasi-experimental design	30 teachers	2017 Nov	30 teachers	The teachers taught a median of two lessons in first aid per year. Cardiopulmonary resuscitation (CPR) was taught by 64% of teachers, free airway and recovery position by 69% and stopping severe bleeding by 51%. Recognising heart attack and stroke was taught by 25% and 23%, respectively. The main factors that the teachers perceived as limiting the amount and quality of first-aid training were insufficient learning objective specifications in the curriculum, too many other competence aims, lack of CPR mannequins and lack of training as first-aid instructors.
9	N Joseph, GS Kumar,1 YPR Babu,2 M Nelliyanil,3 and U Bhaskaran	Medical College in Mangalore City of South India	cross-sectional study	152 medical students	2014 Mar-Apr	152 medical students	Only 11.2% (17/152) of the total student participants had previous exposure to first aid training. Good knowledge about first aid was observed in 13.8% (21/152), moderate knowledge in 68.4% (104/152) and poor knowledge in 17.8% (27/152) participants. Analysis of knowledge about first aid management in select conditions found that 21% (32/152) had poor knowledge regarding first aid management for shock and for gastro esophageal reflux disease and 20.4% (31/152) for epistaxis and foreign body in eyes. All students felt that first aid skills need to be taught from the school level onwards and all of them were willing to enroll in any formal first aid training sessions.
10	Mohandas U1 , Chandan10 GD2	Urban schools Banga-lore	Experimental study	580 teachers	September 28, 2016	580 teachers	Chi-square test was applied to test the significance between trained and untrained teachers. Among the population 70% were males physical education teachers 30% were females. 95% of the teachers had physical education training and 5% did not have the training. 95% of the population had first aid component and 5% did not have. Only 25% of trained physical education teachers had correct knowledge about tooth identification and 17% among untrained teachers. 81% of trained teachers answered correctly regarding management of fractured anterior teeth against 27.5% of untrained teachers (P<0.0002)
11	Nasiru A Ibrahim 1, Abdul Wahab O Ajani 1, Ibrahim A Mustafa 1, Rufai A Balogun 1, Mobolaji A Oludara 1, Olufemi E Idowu 1, Babatunde A Solagberu 1	Surgical Emergency Room (SER) of the Lagos State University Teaching Hospital (Lasuth), Ikeja, Nigeria,	Retrospective review	23,537 patients	January 1, 2012 to December 31, 2014	23,537 patients	A total of 23,537 patients were seen during the study period. Among them, 16,024 (68.1%) had trauma. Road traffic crashes were responsible in 5,629 (35.0%) of trauma cases. Passengers constituted 42.0% of the injured, followed by pedestrians (34.0%). Four wheelers were the most frequent vehicle type involved (54.0%), followed by motor cycles (30.0%). Regions mainly affected were head and neck (40.0%) and lower limb (29.0%). Less than one-quarter (24.0%) presented to the emergency room within an hour, while one-third arrived between one and six hours following injury. Relatives brought 55.4%, followed by bystanders (21.4%). Only 2.3% had formal prehospital care and were brought to the hospital by Lasambus. They also had significantly shorter arrival time. One hundred and nine patients (1.9%) died in the emergency room while 235 bodies were brought in dead.

12	Francis Walugembe 1 2, Francis Levira 2, Balasubramanian Ganesh 3, Dickson Wilson Lwetoijera 1 4	Three Municipalities of Dar es Salaam Region, Tanzania	A retrospective study	6,772 road traffic injuries	2014 to 2018	6,772 road traffic injuries	A total of 6,772 road traffic injuries were reported between 2014 and 2018 and the study recorded the highest RTAs in the year 2014 as compared to the other years within the study period. The death rate from RTAs in Ilala Municipality alone was 36.4 per 100,000 population. About 28% of the total fatalities were recorded among the pedestrians, and there was a significant difference ($P < 0.05$) in the RTAs among the other road users.
13	Yingyu Zhang[13] 1, Linlin Jing 1, Chang Sun 1, Jianlei Fang 2, Yan Feng 3	China	A retrospective study	234 major road traffic accidents	1997 to 2014	234 major road traffic accidents	The frequencies of unsafe acts, violations, and inadequate regulation are the highest in five categories, 15 subcategories, and 63 indicators, respectively. This study has demonstrated a number of associations between the upper and adjacent lower levels. At the outside factors level, "failure to provide supervision for regulatory" can be viewed as a strong predictor to "formal accountability for actions," "norms and rules," and "values and beliefs." At the organizational influences level, "formal accountability for actions," "norms and rules," and "values and beliefs" were strong predictors. At the unsafe supervision level, "failure to provide oversight," "failure to initiate corrective action," and "failure to enforce rules and regulations" had strong prediction on "fatigue driving." At the preconditions for unsafe acts level, "visual limitation", "fatigue driving," and "vehicle faults" were strong predictors
14	Davoud Khorasani-Zavareh[14]*1,2,3, Hamid Reza Khankeh1,4, Reza Mohammadi1, Lucie Laflamme5, Ali Bikmoradi2,6,7 and Bo JA Haglund1	Iran	Grounded Theory	36-semi-structured interviews	6 October 2008 - 12 May 2009	36 - semi-structured interviews	The core variable was identified as "poor quality of post crash management". Barriers to effective post-crash management were identified as: involvement of laypeople; lack of coordination; inadequate pre-hospital services; shortcomings in infrastructure. Suggestions for laypeople included: 1) a public education campaign in first aid, the role of the emergency services, cooperation of the public at the crash site, and 2) target-group training for professional drivers, police officers and volunteers involved at the crash scene. An integrated trauma system and infrastructure improvement also is crucial to be considered for effective post-crash management
15	Rishi Bali[15] 1, Parveen Sharma, Amandeep Garg, Guneet Dhillon	Yamuna Nagar, India	A comprehensive study	740 patients with 1054 fractures	2003-2010	740 patients with 1054 fractures	Road traffic accidents accounted for highest number of fractures predominantly occurring in the age group of 21-30 years (38.3%)1,2. Males incurred more fractures with a male female ratio of 4.2:1. Mandible was the most commonly fractured bone with parasymphysis being the commonest affected site. 76.66% patients had associated head injury and 15.68 % had history of unconsciousness. Open reduction and internal fixation was the preferred modality for mandible whereas the mid face fractures were treated more often by closed methods.

Study selection process:

CONCLUSION

Literature review reveals that First aid is the assistance given to any person suffering a sudden illness or injury, with care it is provided to preserve life and to prevent the condition from worsening, and for promoting recovery. It is important that health assigned teachers are equipped with strong, professional competencies. In order for health promotion actions to be sustainable in schools, teachers must be capable, competent and skilled health educators. As they are at prime position to contribute to a nations health gain through the provision of health education for future adults. Based on findings we can say that the health assigned teachers are having average knowledge regarding first aid. Therefore, the health assigned teachers must be equipped with appropriate and

upgraded knowledge.

Implication to Nursing Practice

Nursing services includes education, training, observation etc. There are many new initiative would be taken in getting them trained, which would help in improving their skills as well as knowledge.

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Disability Status of Rural Elderly: A Socio-demographic Perspectives

J Balamurugan

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Abstract

Until recently, ageing has been a neglected subject in India by both administrators and academicians. But the socio-economic scenario of the country is changing very fast. This has far reaching consequences on the lives of the aged. The life expectancy of the population at every age is also increasing very fast. The increasing health and medical facilities in the country and improved standard of living helped to add years to life with the result that the elderly are living longer than they used to in older days. The main objective of this paper was to provide some information about the socio-demographic characteristics and disability status of rural elderly. In this study conducted in Mannadipet commune out of 3 rural communes in Puducherry district. Total 530 elderly were selected using simple random sampling and were interviewed using the structured and unstructured questionnaire. It is basically seen everywhere elderly face more or less disability concerned to physical fitness. In the present study it is also revealed that majority of respondents are found to suffer from walking and memory loss. Differentials in disabilities across their gender background highlight that, by and large, the percentage of elderly women suffering from memory, visual and walking disabilities is higher as compared to their men counterparts.

Keywords: Rural; Elderly; Health Status; Disabilities; Gender; Ageing; ADL and IADL.

INTRODUCTION

The world is witnessing a scenario of rapidly changing demographic conditions, pre dominantly in developing countries. The resulting slowdown in the growth of the number of children per couple alone with the steady increase in the number of elderly persons has a direct bearing on both inter generational and inter generational equity and solidarity, which constitute the basic foundation of human society. The ageing of the world's populations is the result of the continued decline in fertility rates and increased life expectancy. This demographic change has resulted in increasing numbers and proportions of people who are over 60. As a result, the first time in history when there will be more older people than younger people is rapidly approaching. (WHO, 2010).[1] The number and proportion of people aged

Author's Affiliation: Assistant Professor, Department of Social Sciences, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore 632014, Tamil Nadu, India.

Corresponding Author: J Balamurugan, Assistant Professor, Department of Social Sciences, School of Social Sciences and Languages, Vellore Institute of Technology, Vellore 632014, Tamil Nadu, India.

E-mail: balasocio@gmail.com

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60 years and older in the population is increasing. In 2019, the number of people aged 60 years and older was 1 billion. This number will increase to 1.4 billion by 2030 and 2.1 billion by 2050. This increase is occurring at an unprecedented pace and will accelerate in coming decades, particularly in developing countries. (WHO, 2019).[2]

Population of the elderly in India has been increasing steadily since 1961 as it touched 13.8 crore in 2021, growing faster due to decrease in death rate, according to a study by National Statistical Office (NSO, 2021).[3] The study also stated that the elderly males have outnumbered females in the last two decades (till 2021). But it is projected that elderly females would outnumber elderly males in 2031. Elderly in study means all those people who are of the age of 60 years and above. "According to the Report of the Technical Group on Population Projections for India and States 2011-2036, there are nearly 138 million (13.8 crore) elderly persons in India in 2021 comprising 67 million males and 71 million females," the NSO study 'Elderly in India 2021' said.

Globally, the 60-plus population constitutes about 11.5 percent of the total population of 7 billion. By 2050, this proportion is projected to increaseto about 22 percent when the elderly will outnumber children (below 15 years of age). The elderlyconstitute the fastest growing age segmentwhile the children and working age segments reduce gradually (Fig. 1). In some regions and countries, the proportion of the elderly is however growing faster than the global average. In developed countries, the proportion of the elderly will increase from 22.4 percent in 2012 to 31.9 percent in 2050. This proportion is estimated to more than double in less developed countries with an increase from 9.9 percent in 2012 to 20.2 percent in 2050. In least developed countries, the proportion of the elderly in 2050 is projected to be below 11 percent (UN, 2015).[4]

In Asia as a whole, the proportion of the elderly is expected to increase from 10.5 percent to 22.4 percent during 2012–2050. In East Asia, theproportion of the elderly is expected to be 34.5 percent by 2050. Japan (41.5 percent), South Korea (38.9 percent), China (34 percent) may be expectedto report the highest proportions of the elderly population in the region by 2050. The South Asian Association for Regional Cooperation (SAARC) countries, however, are likely to have only about 21 percent population above 60 years by 2050. Within the SAARC, Bangladesh (22.4 percent), Bhutan (24.1 percent), Maldives (31.2 percent) and Sri Lanka (27.4 percent) are estimated to overshoot the SAARC average for the statistic by 2050. While India is not expected to report more than 19 percent elderly by 2050, the absolute numbers will be very large (UN, 2015).[4]

Thus, in some developing countries, the old-age dependency rate could more than double in 50 years, a phenomenon that was stretched over 150–200 years in much of the developed world. The rapid ageing of developing countries is not accompanied by the increases in personal incomes witnessed in the developed world during its ageing process. Further, the governments of the rapidly ageing developingcountries are slower in recognizing and responding to the demographic shift, largely due to competing development priorities. Countering ageism (the negative stereotyping of older people and prejudice against them) and age discrimination (treating someone differently because of their age) is an addedissue. The percentage of the elderly in India has been increasing at an increasing rate in recent years and the trend is likely to continue in the comingdecades. The share of population over the age of 60 is projected to increase from 8 percent in 2015 to 19 percent in 2050. By the end of thecentury, the elderly will constitute nearly 34 percent of the total population in the country (ORGI, 2011).[5]

Ageing will also have an impact on economic growth, through savings, investment, consumption, labour market behaviour, pensions, taxation and intergenerational transfers. In the social sphere, this phenomenon influences family composition and living arrangements, demand for housing and migration, and the need for health care services. On the political front, population ageing may shape voting patterns and political representation. The recent emphasis studies on elderly persons in the developing world is attributed to their increasing number and deteriorating living conditions in the later years of life. While increasing numbers are attributed to demographic transition, deteriorating social and economic conditions are a result of the fast eroding traditional family system in the wake of rapid modernization, internal and international migration and urbanization. Economic, social and health aspects of this fast growing segment of the population pose a great challenge to all socio-economic sectors in India.

REVIEW OF LITERATURE

Disability of the Elderlyshows that during old age, many elderly, in addition to ill-health, suffer with disabilities. While the most common disability among elderly is reported to be the eyesight, hearing problems, joint problems, teeth

problems also cannot be ruled out. Further, it is of general propensity that elderly may not be able to perform certain Activities of Daily Living (ADL) as well as Instrumental Activities of Daily Living (IADL) mainly because of the less functioning/ malfunctioning of selected organs in the body like, head and neck, hands and forearms, hip, knee and ankle, tongue, etc. Though biological causes are the main reasonsfor such ailments, the lifestyles followed by the elderly persons during their adult ages also would cause damage to a few body organs. In the Indian context, few studies related to these aspects have been carried out at different settings.

Based on the 2001 census data analysis of disabled elderly population for India, Audinarayana (2010)[6] came to the conclusion that the elderly were suffering with different disability conditions. Among the disabled elderly, persons with visual impairment constitute more than fifty percent followed by movement disability and hearing. The magnitudes of all the five disability under consideration were much higher in rural areas (hearing and seeing are still more large, about 82 percent) than their rural counterparts, whereas gender differentials were marginal in the case of all disabilities. However, the magnitudes of majority of the disabilities were much higher among married men as against women; the reverse pattern was true in the case of widowed women as compared to elderly men. Likewise, among main workers the levels of majority of the disabilities were higher among men than their women elderly counterparts. All these findings lead to the conclusion that aged persons who belong to lower strata of the society (rural and scheduled castes/tribes) as well as socially disadvantaged (widowed) were more vulnerable to various types of disabilities.

The number of older people is projected to increase in both developed and developing countries. The incidence and prevalence of functional disability are higher among older people and is higher at older ages (Kovar, 1991).[7] By Dillip (2001)[8] in Kerala found that visibility was the most prominent form of disability among elderly followed by locomotors, hearing, senility and speech disability. Sex wise differentials showed that the conditions like visual, hearing and speech disabilities were predominant for females than males.

Dilip (2003)[9] noticed the prevalence of different physical disabilities in the following order: visual, locomotor, hearing, amnesia and speech. With a few exceptions, the prevalence rates of physical disabilities were higher among old (70-79 years), females, currently unmarried, rural areas, belonging to less monthly per capita consumer expenditure of households and economically fully dependent on their counterparts. Rao's (2007)[10] study in rural Andhra Pradesh showed that slightly more than one-third of the respondents had reported having difficulty in seeing and one-fourth with hearing problems; women's proportions were significantly more than men in both these difficulties. In the case of their ability to perform certain physical work, they had difficulty in bathing, dressing and going to toilet. However, these proportions were slightly higher among women as compared to men elderly in the case of latter two activities, whereas the opposite pattern was noticed in the case of bathing.

Goswami et al. (2005)[11] in their rural study observed that a large majority of the elderly had vision related disabilities closely followed by other disabilities. Large number of aged, though not using, felt the need for the respective aids. Further, the most common reason for not using these aids was non-availability followed by carelessness, especially in the case of vision, hearing and walking. The other reasons mentioned were fear, wrong belief and shyness. An examination of mental status (cognitive impairment) among the rural elderly in Faridabad district, Haryana by Goswami *et al*. (2006)[12] highlighted that about one-fifth of sample respondents had cognitive defect. On screening, such proportion was found to be higher among females than among males.

METHODOLOGY

One of the major problems during old age is disability status. To a major extent disabilities occur among elderly because of biological reasons, but the role of socio-economic status and lifestyle patterns adopted during adult ages cannot be ruled out. While a large number of elderly likely to be affected by different disabilities, in fact with an increase in age the likelihood of cropping up disabilities would be higher, some would not be. Keeping this in mind, in this research paper takes the agricultural setting of rural Puducherry elderly persons suffer with physical disability with regard to socio-demographic perspectives. It has been carried out by taking descriptive research design and a semi structure interview schedule with 530 respondents in Mannadipet Commune of Puducherry. An attempt is made to analyse the patterns of disability status among the sample elderly, differentials in their disability status across their selected demographic and socio-economic.

For all these purposes, information about the disabilities from which elderly are suffering has been collected in this study and analysed here. The exact measurement of the disability status variables at each stage of analysis is given in the concerned sections.

DATA ANALYSIS

Patterns of Disability Status among the Elderly

Data given in panel 1 of Table 1 shows that overwhelming percentage of the elderly are suffering from walking and memory disorder, whereas slightly more than three-fourth of them are suffering from visual disability. More than two-fifth of the elderly is suffering with hearing and some have disability of speech. Differentials in disabilities across their gender background highlight that, by and large, the percentage of elderly women suffering from memory, visual and walking disabilities is higher as compared to their men counterparts. Moreover, speech and hearing disabilities is higher among men elderly. However, the chi-square results turned out as highly significant in the case of hearing disability, whereas such results are moderately significant in the case of speech and walking and not-significant in the case of memory and visual disabilities. But across their age wise, it is conspicuous to note that the percentage of elderly suffering from various disabilities is invariably higher among old-old than their young-old counterparts. The chi-square results between the age groups and disabilities have been emerged as highly significant ($p<0.001$) in the case of walking, and moderately significant ($p<0.05$) in the case of visual, speech and hearing.

When the data on disabilities of elderly is analysed as cumulative score (for details see Appendix), elderly suffering from overall disabilities (panel 2 of Table 1 and Fig. 1), it can be seen that nearly three fourth suffer with more than three disabilities. On the other hand, slightly more than one-fifth are suffering from at least one-two of the disabilities condition under consideration and rest only few do not suffer with any disabilities. As gender wise differentials in this regard show that the percentage of elderly who have three or more disabilities is almost equal among men and women counterparts, whereas more than one-fifth of the men elderly suffer from one-two disability as against nearly one-fifth of women. As expected, comparatively higher percentage of men elderly do not have any disability as against less of women elderly. Such patterns are more conspicuous across their age-wise under consideration. Obviously, the chi-square results too turned out as highly significant ($p<0.001$) across their gender as well as age categories.

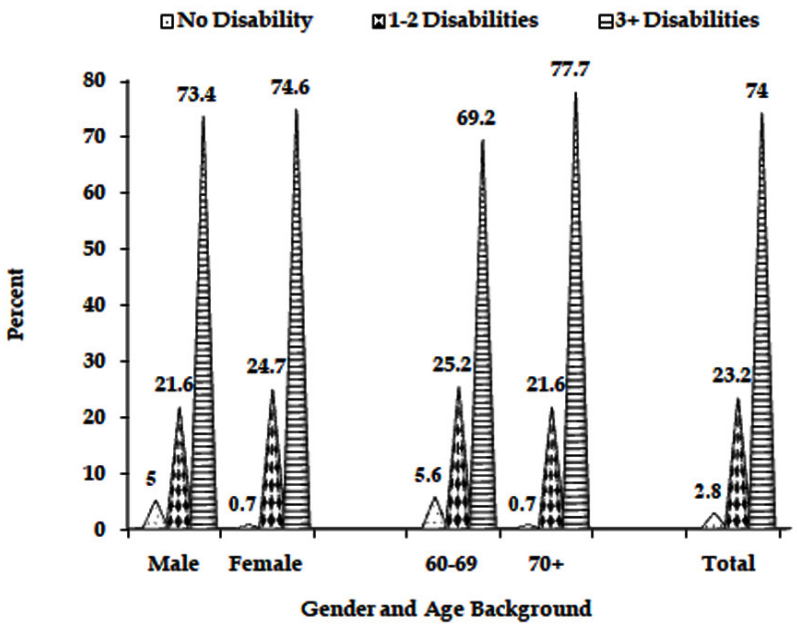

Fig. 1: Percentage Distribution of the Elderly who are Suffering with Overall Disabilities across their Gender and Age Background.

Table 1: Percentage Distribution of those Elderly who are Suffering with Types of Disabilities across their Gender and Age Background.

Type of Disability	Gender								Age								Total			
	Male				Female				60-69				70+							
	Good		Poor		Good		Poor		Good		Poor		Good		Poor		Good		Poor	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Memory $^{NS/NS}$	35	13.5	224	86.5	27	10.0	244	90.0	33	14.1	201	85.9	29	9.8	267	90.2	62	11.7	468	88.3
Visual $^{NS/*}$	62	23.9	197	76.1	64	23.6	207	76.4	67	28.6	167	71.4	59	19.9	237	80.1	126	23.8	404	76.2
Speech$^{*/*}$	149	57.5	110	42.5	186	68.6	85	31.4	161	68.8	73	31.2	174	58.8	122	41.2	335	63.2	195	36.8
Hearing$^{***/*}$	124	47.9	135	52.1	168	62.0	103	38.0	141	60.3	93	39.7	151	51.0	145	49.0	292	55.1	238	44.9
Walking$^{*/***}$	36	13.9	223	86.1	18	6.6	253	93.4	38	16.2	196	83.8	16	5.4	280	94.6	54	10.2	476	89.8

Note: NS, * and *** = Chi-square results are Significant at Not-Significant, 0.05 and 0.001 respectively.

Overall Disabilities (Index)	Gender				Age				Total	
	Male		Female		60-69		70+			
	No.	%	No.	%	No.	%	No.	%	No.	%
No Disability	13	5.0	2	0.7	13	5.6	2	0.7	15	2.8
1-2 Disabilities	56	21.6	67	24.7	59	25.2	64	21.6	123	23.2
3+ Disabilities	190	73.4	202	76.6	162	69.2	230	77.7	392	74.0
$\chi 2$ – Value; Sig. Level	9.151; 0.01				12.991; 0.001					

Note: Percentages for each category of the variables have been calculated by Column wise.

Differentials in Number of Disabilities from which Elderly Suffering by their Background Characteristics

In addition to the gender and age wise differentials in the percentage of elderly suffering from cumulative disabilities (Table 1), an attempt is also made here to analyse differentials across their background characteristics and presented the same in Table 2. The results highlight that the percent of elderly suffering from three or more disabilities tend to decrease or found to be lower with an increase or found to be higher in their socio-economic status, viz., forward castes, educational status (Fig. 2), occupational status and monthly personal income, as well as monthly family income, three or more in total number of children, four or more in total number of family members and three or more in total number of earning members in the family and particularly, among those who living with relatives/others.

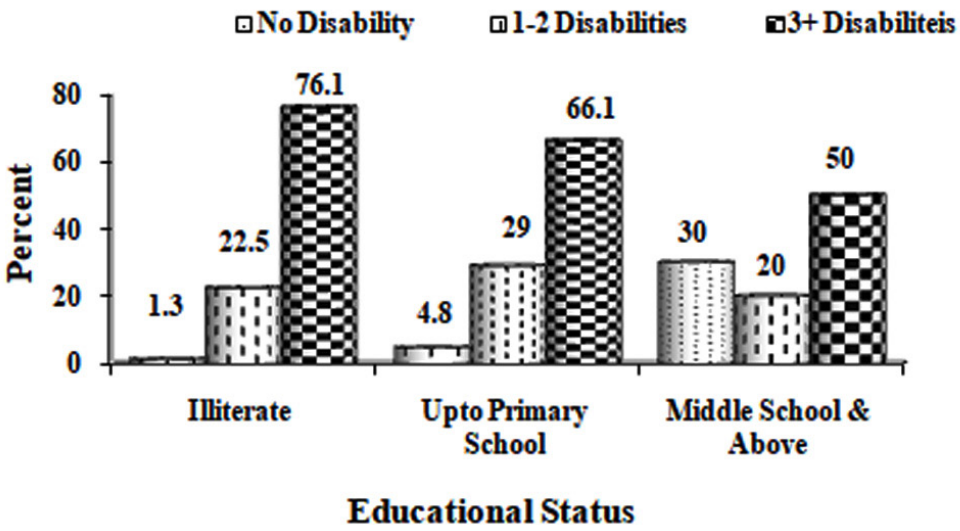

Fig. 2: Percentage Distribution of the Elderly by Number of Disabilities across their Educational Status

Conversely, the percentage of elderly suffering from more number of disabilities is higher among scheduled castes/tribes, single/widowed/ separated/divorces, illiterates, non-working elderly, low monthly personal income, as well as low monthly family income, no children, no earning members and living alone and with spouse. Conspicuously, majority of these differentials across their background characteristics are turned out as in statistically high significant ($p<0.001$ in each case and moderate significant ($p<0.05$) in the case of monthly family income and total number of earning members), expect in the case of caste, where the total number of children, total number of family members and their living arrangements. All these results to a large extent support of elderly from lower socio-economic status categories are suffering with more number of disabilities.

Table 2: Percentage Distribution of the Elderly by Number of Disabilities they are suffering across their Background Characteristics

Background Characteristics of the Elderly	Suffering from Number of Disabilities						
	No Disability		1-2 Disability		3+ Disabilities		Total
	No.	%	No.	%	No.	%	No.
1. Caste							
Scheduled Castes/Tribes	8	3.8	39	18.8	161	77.4	208
Most Backward Castes	3	1.2	69	27.0	184	71.9	256
Backward Castes	3	5.4	13	23.2	40	71.4	56
Forward Castes	1	10.0	2	20.0	7	70.0	10
χ^2 – Value; Sig. Level				10.252; NS			
2. Marital Status							
Married	14	5.6	54	21.5	183	72.9	251
Si. / Wi. / Se. / Di. / De.	1	0.4	69	24.7	209	74.9	279
χ^2 – Value; Sig. Level				***13.379; 0.001***			
3. Educational Status							
Illiterate	6	1.3	101	22.5	341	76.1	448
Primary school	3	4.8	18	29.0	41	66.1	62
Middle school & above	6	30.0	4	20.0	10	50.0	20
χ^2 – Value; Sig. Level				***59.996; 0.001***			
4. Occupational Status							
No Work	8	1.9	92	21.4	329	76.7	429
Coolie	–	–	16	27.6	42	72.4	58
Agriculture	6	20.7	11	37.9	12	41.4	29
Busi. / Pvt. Com./ Others	1	7.1	4	28.6	9	64.3	14
χ^2 – Value; Sig. Level				***45.383; 0.001***			
5. Monthly Income							
< 1000	6	1.6	82	21.5	293	76.9	381
1001 – 2000	5	4.1	30	24.8	86	71.1	121
2001 +	4	14.3	11	39.3	13	46.4	28
X^2 – Value; Sig. Level				***22.997; 0.001***			
6. Monthly Family Income							
< 3000	3	1.3	47	20	185	78.7	235
3001 – 6000	3	2.3	38	28.8	91	68.9	132
6001 +	9	5.5	38	23.3	116	71.2	163
X^2 – Value; Sig. Level				***10.477; 0.05***			
7. Total No. of Children							
0	–	–	5	18.5	22	81.5	27
1 – 2	5	2.8	40	22.7	131	74.4	176
3 +	10	3.1	78	23.9	239	73.1	327

χ^2 – Value; Sig. Level				***1.402; NS***			
8. Total No. of Family Members							
1	–	–	24	22.2	84	77.8	108
2 – 3	5	2.9	37	21.1	133	76.0	175
4 +	10	4.0	62	25.1	175	70.9	247
X^2 – Value; Sig. Level				***5.735; NS***			
9. Total No. of Earning Members							
0	2	1.2	32	19.9	127	78.9	161
1	4	3.8	16	15.4	84	80.8	104
2	3	2.1	42	30.0	95	67.9	140
3 +	6	4.8	33	26.4	86	68.8	125
χ^2 – Value; Sig. Level				***12.940; 0.05***			
10. Living Arrangements							
Alone	–	–	24	22.2	84	77.8	108
With Spouse	3	2.7	22	19.8	86	77.5	111
With Son's Family	8	4.6	37	21.4	128	74.0	173
With Daughter's Family	–	–	15	30.0	35	70.0	50
With Unmarried Children	4	5.5	20	27.4	49	67.1	73
With Relatives / Others	–	–	5	33.3	10	66.7	15
χ^2 – Value; Sig. Level				***12.804; NS***			

Note: Not Applicable; NS = The Chi-square test are Not Significant;
Si./Wi./Se./Di./ De. = Single / Widowed / Separated / Divorced / Deserted;
Buss. / Pvt. Com. = Business / Private Company;
Percentages for each category of the variables have been calculated by Row-wise;
The Chi-square test results those are significant at different levels denoted as bold and italics.

Summary and Conclusion

An analysis of disability status of the elderly established that greater majority of the elderly are suffering from walking and memory disorders, whereas more than three fourth of them are suffering from visual disability. Around more than two-fifth of the elderly are found to suffer from hearing disability whereas, more than one-third of the elderly suffer from speech. In the case of memory, visual and walking disabilities, women and old-old suffer more than their men and young old counterparts. However, total number of disabilities indicates that nearly three-fourth of the elderly suffer with more than three disabilities. Gender and age wise differentials suggest that the percentage of elderly who have three or more disabilities is almost equal among men and women counterparts, whereas, such percentages are higher in old-old than young-old elderly. Obviously, the chi-square results too turned out highly significant across their gender as well as age categories ($p<0.01$ and $p<0.001$, respectively).

In addition to gender and age wise differentials in disability status, the percent of elderly suffering from three or more disabilities tend to decrease or are found to be much lower with an increase or higher in their socio-economic characteristics, viz., educational status, occupational status, monthly personal and family income, total number of children, total number of family members, total number of earning members in the family and obviously among the type of living arrangements. Conversely, the percentage of elderly suffering from more number of disabilities is higher among those who belonged to scheduled castes/ tribes, single/widowed/separated/divorced/ deserted, illiterates, non-earning and less earning income group, living alone and with spouse to a higher extent. Conspicuously, majority of these differentials across their background characteristics are turned out as statistically highly significant ($p<0.001$ in each case and moderately significant ($p<0.05$) in the case of monthly family income and total number of earning members), expect in the case of caste, total number of children, total number of family members and their type of living arrangements.Conversely, the prevalence of disability is much lower among those who belong to educated and agricultural labourers as well as to some extent among those who earning high individual monthly income.

Almost all the elderly (except 15 members) reported

that they were suffering from one or the other disability condition, viz., memory, visual, speech, hearing and walking. The percentages in these regard are relatively higher among women and old-old than their counterparts. Conversely, the prevalence of disability is much lower among those who belong to educated and agricultural labourers as well as to some extent among those who earning high individual monthly income.

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A Study to assess the Menstrual Discomfort Experienced and Remedial Measure Practiced by Late Adolescent Girls in Olpad Taluka of Surat with a view to Develop & Instructional Booklet

Alka Tajne[1], Hinali Mahyavanshi[2], Karina Patel[3], Kinjal Patel[4], Smita Tandel[5], Asha Vaishnav[6]

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Abstract

Menstrual discomforts include a variety of conditions in which is the discomfort, heavy, painful, or does not occur at all. One type of menstrual discomforts happens when a girl menstrual period does not occur for morethan 35 days after the last menstrual period.

Objective of the Study: (1) To assess the menstrual discomforts experienced among late adolescent girls in Olpad taulka. (2) Assess the remedial measures practiced for menstruation discomforts by the late adolescent girls.

Method: In the present study, Non-experimental survey design is selected for the study the study design depicts that in intervention given checklist and self-structured questionnaire for assess the menstrual discomforts experiences and remedial measures practices. After that as a 'Planned to give instructional booklet'.

Conclusion: This chapter deals with the conclusion, implications, recommendations and limitations of study, "A study to assess the menstrual discomforts experienced and remedial measures practiced by late adolescent girls in Olpad taluka of Surat."

Keywords: Menstrual Discomfort; Remedial Measure Practiced; Late Adolescent Girls; Olpad Taluka; Surat; Develop & Instructional Booklet.

Author's Affiliation: [1]Professor, [2-6]4th year B.Sc. Nursing Students, Vibrant Nursing College, Masma, Olpad Surat 394540, Gujarat, India.

Corresponding Author: Alka Tajne, Professor, Vibrant Nursing College, Masma, Olpad Surat 394540, Gujarat, India.

E-mail: alkatajne@gmail.com

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INTRODUCTION

Adolescence is a time of moving from the immaturity of childhood into the maturity of adulthood. Period of life from puberty to adulthood characterized by marked physiological changes, development of sexual feelings, efforts toward the construction of identity, and a progression from concrete to abstract though. Menstruation (Greek word, men-month) is monthly uterine bleeding

outflowing through vagina onto vulva for 4-5 days every 28 days during reproductive life of women from menarche to menopause. "Menses" are normal uterine function whereby endometrium prepares to receive pregnancy. Adolescent gets 13 menses in a year and around 400 menses in her reproductive life. Menstrual is the periodical flow of blood from the uterus through the cervix and out through the vagina, and it also called a "period.

OBJECTIVES

- To assess the menstrual discomforts experienced among late adolescent girls in Olpad taluka.
- To assess the remedial measures practiced for menstruation discomforts by the late adolescent girls.

ASSUMPTION

- Late adolescent girls may some experience some kind of menstrual discomforts.
- Late adolescent girls may practice some remedial measures to treat or to reduce menstrual discomforts.

MATERIAL AND METHODS

The research Methodology I was to structure a study and to gather and analyze information in a systematic fashion.

Research approach: Evaluative approach

Research design: A non experimental design

Variables: Research variables are concepts at various level of abstraction that are measured manipulated & controlled in study.

Demographic Variables

The demographic variables are age in years, education, socio-economical status, dietary pattern, nutritional status, age of menarche, medical diagnosis of late adolescence girl, duration.

Research variables

Research variables are used to assess menstrual discomfort experienced by late adolescence girls.

Sampling criteria

The following criteria are set to select the sample:

Inclusion Criteria

- Late adolescent girls who are age between 16 to 21 year.
- Late adolescent girls who are same age group participate in the Study.

Exclusion criteria

- Adolescent girls who are below the age of 16 and above 21 yrs.

Setting of the study: The study was conducted at selected areas of olpad taulka.

Population: Late adolescent girls.

Sample size: 60 late adolescent girls.

Sampling Technique: Non probability purposive sampling technique.

RECOMMENDATIONS

Based on the findings of the study the following recommendations are put forward for future research.

- A similar study may be conducted on a larger sample for a wider generation.
- Comparative study can be conducted between the rural and urban late adolescent girls regarding knowledge of menstrual discomfort.
- Correlational study can be conducted between the knowledge, attitude & practices regarding menstrual discomfort among late adolescent girls.
- Study can be conducted by including control and experimental group in the study.

FINDING OF THE STUDY

The major findings of the study are summarized follow:

- Majority 48.33% of sample was belongs to age group between 20-21 year.
- Majority 76.66% of the sample was belongs to higher secondary level education.
- Majority 55% of the sample was middle class socio-economic status.
- Majority43.33% of the sample have normal nutritional status.
- Majority 66.66% of the sample was belongs to Mixed dietary pattern.

- Majority 54.17% of the respondents belongs to 13- 15 year of age of menarche.
- Majority 48.33% of the respondents having 1 to 4 days duration of menstruation.

CONCLUSION

75% late adolescent girls are having menstrual discomforts and other 25% girls are not having menstrual discomforts. 50% respondents having abdominal pain during menstruation and 41% late adolescent girls having nausea and vomiting.58% late adolescent girls having pain in lower extremities and back then 33% respondents having feeling of stress during menstrual discomforts. In this study 66% girls having aches problem during menstruation and 25% respondents having speeding pattern changes.

16% late adolescent girls are used acupuncture points during menstrual discomforts. Then 36% late adolescent girls are used ginger tea during menstrual discomforts. 31% late adolescent girls used oil for massaging during menstrual discomforts and 53% respondents are perform hot water compression during menstrual discomforts for reliefing and 43% girls are do yoga and exercises. In this study 20% girls are take treatment for menstrual discomforts and 46% respondents used home remedies during menstrual discomforts.

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Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, Analyzis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

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Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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