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Sociodemographic and Epidemiological profile of Chronic Wound Patients attended in a Tertiary Care Hospital in Eastern Uttar Pradesh, India: A Cross-Sectional Study

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ABSTRACT

Background: Chronic wounds are persistent skin lesions and are the major health concern worldwide and has significant impact on the health and quality of life that exceed normal healing periods. Managing chronic wounds involves understanding their epidemiological and sociodemographic profiles to manage the patients. **Aim:** This study aimed to assess the sociodemographic and epidemiological characteristics of chronic wound patients to identify factors associated with chronic wounds among patients attending a tertiary care hospital. **Methodology:** Data were collected from 240 chronic wound patients ranging between aged 20 to 76 years using a pre-tested structured schedule between August 2023 to March 2024. Variables such as age, gender, occupation, socio-economic status, types, sites, number, and recurrences of chronic wound were recorded. Statistical associations were assessed using Fisher's Exact Probability Test or χ^2 test. **Results:** The study revealed a varied sociodemographic profile among chronic wound patients. Significant associations were found between age groups and types of chronic wound. Venous ulcers were prevalent in older adults (40-59 years), while diabetic foot ulcers were more common among the elderly (≥60 years). Chronic wound also differed significantly by demographic factors. **Observation and Discussion:** This study updates the understanding of chronic wound of site and recurrence in eastern Uttar Pradesh, highlighting the need for tailored wound care strategies based on demographic profiles. Addressing these factors can potentially optimize treatment protocol and improve patient and its health. The longitudinal studies are required to explore the survival and economic burden on the patient, family, society, and nation.

Keywords: Sociodemographic, Chronic wound, Epidemiology, Cross-sectional study

Introduction

Chronic wounds (CWs) are the major health concern worldwide and have significant impact on the health of patients and their families[1-3]. It is estimated that 1 to 2 % of the population will experience a chronic wound during their lifetime in developed countries[4]. In future this estimate, expected to rise with aging populations worldwide[4-5]. Particularly, in developing countries like India, the prevalence rates for chronic wounds and overall wounds was approximately 4.5 and 15.03 per 1000 in general population, respectively[6,7]. Chronic wounds are classified into four main categories based on their causative etiologies such as, pressure ulcers, diabetic ulcers, venous ulcers, and arterial insufficiency ulcers[8]. Moreover, chronic wounds are causing pain, loss of function and mobility, depression, distress and anxiety, embarrassment and social isolation, financial burden, prolonged hospital stays and chronic morbidity or even death. Successful wound treatment is requiring to correctly identifying the aetiology of a chronic wound, as well as the local and systemic factors that may be contributing to poor wound healing[9,10]. Moreover, in recent years, the incidence of chronic wounds has been growing like a 'silent epidemic'[11], due to the ageing population and the concurrent increase in comorbidities and lifestyle diseases such as diabetes, obesity, venous hypertension and peripheral vascular diseases[12,13] and also it making their management challenging as they are not just isolated conditions but indicators of broader health issues[6,14-15].

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However, recurrence rates remain high, with up to 40% of diabetic foot ulcers (DFUs) and 69% of venous leg ulcers within one-year post-treatment[16-17]. In India, regions like Eastern Uttar Pradesh face additional challenges due to healthcare access inequalities that may exacerbate the prevalence and severity of chronic wounds. Understanding the epidemiological and socio-demographic profile of chronic wounds is essential for developing targeted interventions and improving patient outcomes. Consequently, there is a lack of comprehensive research and data on the epidemiology and sociodemographic burden of chronic wounds in Eastern Uttar Pradesh, India. The novelty of this study lies in its focus on Eastern Uttar Pradesh, characterized by distinct socio-cultural dynamics and healthcare challenges. By exploring the types, sites, numbers, and recurrence of chronic wounds within this specific context. The findings of this study are expected to significantly contribute to the existing body of knowledge on chronic wound epidemiology, particularly in underrepresented regions. Thus, the present study is aimed to investigate a diverse range of demographic variables including age, gender, education, occupation, and socio-economic status, and their associations with chronic wound characteristics.

Material and Methods

Study Area: The study was conducted at the OPD of General Surgery, Sir Sunderlal Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Eastern Uttar Pradesh, a tertiary care hospital covering the population of eastern UP, western Bihar, MP, Chhattisgarh, Jharkhand.

Study Design and Number of Participants: This hospital-based cross-sectional study took place from July 2023 to March 2024. A pre-tested structured schedule was used for data collection via face-to-face interviews. The study employed a complete enumeration method. This study is based upon 240 chronic/recurrent chronic wounds patients who had completed the three follow-ups at the interval of one month during the July 2023 to December 2023 for registration and next 3 months for follow-ups. Here chronic wound is defined as, all the patients who had more than 6 weeks of wounds been including in this study.

Inclusion Criteria: The chronic wound patients in the aged equal or greater than 20 years irrespective of gender were included. All the patients who had more than 6 weeks of wounds fulfilling the inclusive and exclusive criteria and given written informed consent were included in this study.

Exclusion Criteria: The Patients without wound or with a wound that less than 6 weeks, were excluded in the study. Patients suffering from advanced chronic diseases such as cancer, kidney and liver diseases, severe systemic sepsis, etc.

Study Variables: Sociodemographic characteristics of the patients such as age, gender, religion, present place of residence, type of family, education, caste, occupation, marital status, body mass index (BMI, kg/m^2), and socioeconomic status were recorded as independent variable. Dependent variables for the chronic wound patients were types, site, number, and recurrences of chronic wound.

Statistical Analysis: The collected data was entered into MS Excel Software 2019 version and then excel data were imported into SPSS Software. Statistical analysis was performed using SPSS Software (version 28.0. IBM Corp., NY.). Quantative variables were presented as (Mean ± Standard Deviation). Categorical variables were presented as frequencies and percentages. Associations were assessed using Fisher's Exact Probability Test or χ^2 test as appropriate, with statistical significance set at P value <0.05 at two-sided test.

Ethical Clearance: The study received approval from the Institutional Ethics Committee of Institute of Medical Sciences, Banaras Hindu University, Varanasi (Letter No.: Dean/2023/EC/6165 dated: 28/07/2023).

Results

Socio-demographic characteristics of chronic wound patients

The findings are based on 240 chronic wound patients enrolled during August 2023 to March 2024. The majority of respondents were male (86.3%), Hindu (92.5%), and from nuclear families (81.7%). The mean age of the subjects was 48.80 years (±11.8), with 61.3% falling in the age group of 40-60 years. A significant portion of respondents (62.9%) resided in rural areas, and most (86.7%) were literate. Married individuals constituted 94.6% of the study subjects. Employment status varied, with 5% unemployed, 12.5% daily-wagers, and 28.7% engaged in government/private services. Majority of the respondents belongs to the OBC category (54.6%), Normal weight (38.3%), and lower middle class (37.1%) **(Table- 1).**

Table- 1: Socio-demographic characteristics of chronic wound patients

Variables	Categories	No.	%
Age	20-39	52	21.7
	40-59	142	59.2
	≥ 60	46	19.2
Gender	Male	207	86.2
	Female	33	13.8
Religion	Hindu	222	92.5
	Muslim	18	7.5
Place of Residence	Rural	151	62.9
	Urban	89	37.1
Type of Family	Nuclear	196	81.7
	Joint	44	18.3
Education	Illiterate	32	13.3
	Primary/Middle	49	20.4
	10th/12th	89	37.1
	UG/PG	70	29.2
Caste	General	80	33.3
	OBC	131	54.6
	SC/ST	29	12.1
Occupation	Unemployed	12	5.0
	Home maker	30	12.5
	Farmer	33	13.8
	Daily-wager	30	12.5
	Gov./Private Services	69	28.7
	Business	66	27.5
Marital Status	Married	227	94.6
	Others	13	5.4
Body Mass Index	Under weight	22	9.2
	Normal weight	92	38.3
	Over weight	52	21.7
	Obese	74	30.8
Socioeconomic Status	Upper Class	8	3.3
	Upper middle class	48	20
	Middle class	43	17.9
	Lower middle class	89	37.1
	Lower class	52	21.7

Association between socio demographic characteristics and type of chronic wounds: Venous ulcers were more prevalent among aged 20-40 years, while diabetic foot ulcers predominated among aged 60 years and older. Educational attainment also influenced types of chronic wound, with graduates and above showing higher proportion of both diabetic foot and venous ulcers. Venous ulcers were found more prevalent in man and farmer, while diabetic foot ulcers predominated among female and daily-wager. The present study results were observed significant associations ($p<0.05$) between types of chronic wound with age, gender, caste, occupation, marital status, and body mass index **(Table-2).**

Table -2: Association of sociodemographic variables with types of chronic wounds among the patients.

Variables		Type of chronic wounds						P-value
		Arterial Ulcer		Diabetic Foot Ulcer		Venous Ulcer		
		No.	%	No.	%	No.	%	
Age Group	20-39	14	26.9	11	21.2	27	51.9	**<0.001***
	40-59	11	7.7	65	45.8	66	46.5	
	≥ 60	06	13.0	29	63.0	11	24.0	
Gender	Male	23	11.1	84	40.6	100	48.3	**<0.001***
	Female	8	24.2	21	63.6	4	12.2	
Religion	Hindu	29	13.1	95	42.8	98	44.1	0.572*
	Muslim	2	11.1	10	55.6	6	33.3	
Place of Residence	Rural	16	10.6	70	46.4	65	43.0	0.311*
	Urban	15	16.9	35	39.3	39	43.8	
Type of Family	Nuclear	23	11.7	92	46.9	81	41.4	0.099*
	Joint	8	18.2	13	29.5	23	52.3	
Education	Illiterate	5	15.6	17	53.1	10	31.3	0.129*
	Primary/Middle	2	4.1	18	36.7	29	59.2	
	10th/12th	13	14.6	42	47.2	34	38.2	
	UG/PG	11	15.7	28	40.0	31	44.3	
Caste	General	17	21.3	34	42.5	29	36.2	**0.016***
	OBC	11	8.4	63	48.1	57	43.5	
	SC/ST	3	10.3	8	27.6	18	62.1	
Occupation	Unemployed	2	16.7	7	58.3	3	25.0	**<0.001#**
	Home maker	7	23.3	19	63.4	4	13.3	
	Farmer	2	6.1	22	66.6	9	27.3	
	Daily-wager	2	6.7	6	20.0	22	73.3	
	Gov./Private Services	12	7.4	26	37.7	31	44.9	
	Business	6	9.1	25	37.9	35	53.0	
Marital Status	Married	27	11.9	104	45.8	96	42.3	**0.014***
	Others	4	30.8	1	7.7	8	61.5	
Body Mass Index	Under weight	5	22.7	12	54.6	5	22.7	**<0.001***
	Normal weight	14	15.2	50	54.4	28	30.4	
	Over weight	5	9.6	25	48.1	22	42.3	
	Obese	7	9.5	18	24.3	49	66.2	
Socioeconomic Status	Upper Class	0	0	2	25.0	6	75.0	0.472*
	Upper middle class	4	8.3	20	41.7	24	50.0	
	Middle class	6	14.0	18	41.9	19	44.1	
	Lower middle class	15	16.9	38	42.7	36	40.4	
	Lower class	6	11.5	27	51.9	19	36.6	

*Chi-square test; #Fisher's exact test

Association between socio demographic characteristics & site of chronic wounds: Lower leg/ankle wounds were more common among 20-40-year-olds, whereas foot ulcers were prevalent among aged 60 years and older. Females were disproportionately affected by foot-related wounds, while daily-wagers and pre-obese individuals

showed a higher proportion of lower leg/ankle wounds. The current study revealed that the chronic wound sites showed significant associations ($p<0.05$) with age, gender, occupation, marital status, and body mass index **(Table-3).**

Table- 3: Association of sociodemographic variables with site of chronic wounds of respondents.

Variables		Site of chronic wounds						P-value
		Foot		Lower Leg/Ankle		Upper Leg/ Groin		
		No.	%	No.	%	No.	%	
Age Group	20-39	11	21.2	32	61.5	9	17.3	**0.001**[#]
	40-59	63	44.4	70	49.3	9	6.3	
	≥ 60	29	63.0	14	30.5	3	6.5	
Gender	Male	82	39.6	108	52.2	17	8.2	**0.012**[*]
	Female	21	63.7	8	24.2	4	12.1	
Religion	Hindu	93	41.9	108	48.6	21	9.5	0.288[*]
	Muslim	10	55.6	8	44.4	0	0	
Place of Residence	Rural	69	45.7	72	47.7	10	6.6	0.238[*]
	Urban	34	38.2	44	49.4	11	12.4	
Type of Family	Nuclear	90	45.9	89	45.4	17	8.7	0.126[*]
	Joint	13	29.5	27	61.4	4	9.1	
Education	Illiterate	16	50.0	12	37.5	4	12.5	0.609[*]
	Primary/Middle	18	36.7	27	55.1	4	8.2	
	10th/12th	41	46.1	43	48.3	5	5.6	
	UG/PG	28	40.0	34	48.6	8	11.4	
Caste	General	33	41.3	38	47.4	9	11.3	0.269[*]
	OBC	62	47.4	59	45.0	10	7.6	
	SC/ST	8	27.6	19	65.5	2	6.9	
Occupation	Unemployed	7	58.4	4	33.3	1	8.3	**<0.001**[#]
	Home maker	19	63.3	8	26.7	3	10.0	
	Farmer	21	63.6	9	27.3	3	9.1	
	Daily-wager	6	20.0	24	80.0	0	0	
	Gov./Private Services	26	37.7	33	47.8	10	14.5	
	Business	24	36.4	38	57.5	4	6.1	
Marital Status	Married	102	44.9	105	46.3	20	8.8	**0.021**[*]
	Others	1	7.7	11	84.6	1	7.7	
Body Mass Index	Under weight	5	22.7	12	54.6	5	22.7	**0.001**[*]
	Normal weight	14	15.2	50	54.4	28	30.4	
	Over weight	5	9.6	25	48.1	22	42.3	
	Obese	7	9.5	18	24.3	49	66.2	
Socioeconomic Status	Upper Class	2	25.0	6	75.0	0	0	0.264[#]
	Upper middle class	20	41.7	27	56.2	1	2.1	
	Middle class	17	39.5	22	51.2	4	9.3	
	Lower middle class	37	41.6	40	44.9	12	13.5	
	Lower class	27	51.9	21	40.6	4	7.5	

[*]Chi-square test; [#]Fisher's exact test

Association between socio demographic characteristics & number of chronic wounds: Illiterate individuals had a higher proportion of multiple chronic wounds, whereas those with higher education levels exhibited fewer instances. Similarly, SC/ST respondents and those from lower socio-economic backgrounds showed higher rates of single chronic wounds. The number of chronic wounds, demonstrating significant associations ($p<0.05$) with education, caste, and socio-economic status **(Table-4).**

Table- 4: Association of sociodemographic variables with number of chronic wounds of respondents.

Variables		Number of Chronic Wounds				P-value
		Single		Multiple		
		No.	%	No.	%	
Age Group	20-39	37	71.2	15	28.8	0.453*
	40-59	112	78.9	30	21.1	
	≥ 60	37	80.4	9	19.6	
Gender	Male	163	78.7	44	21.3	0.248*
	Female	23	69.7	10	30.3	
Religion	Hindu	172	77.5	50	22.5	0.977#
	Muslim	14	77.8	4	22.2	
Place of Residence	Rural	114	75.5	37	24.5	0.333*
	Urban	72	80.9	17	19.1	
Type of Family	Nuclear	150	76.5	46	23.5	0.448*
	Joint	36	81.8	8	18.2	
Education	Illiterate	18	56.2	14	43.8	**0.015***
	Primary/Middle	38	77.6	11	22.4	
	10th/12th	71	79.8	18	20.2	
	UG/PG	59	84.3	11	15.7	
Caste	General	66	82.5	14	17.5	**0.048***
	OBC	94	71.8	37	28.2	
	SC/ST	26	89.7	3	10.3	
Occupation	Unemployed	8	66.7	4	33.3	0.513*
	Home maker	21	70.0	9	30.0	
	Farmer	28	84.8	5	15.2	
	Daily-wager	21	70.0	9	30.0	
	Gov./Private Services	55	79.7	14	20.3	
	Business	53	80.3	13	19.7	
Marital Status	Married	177	78.0	50	22.0	0.496#
	Others	9	69.2	4	30.8	
Body Mass Index	Under weight	15	68.2	7	31.8	0.558*
	Normal weight	72	78.3	20	21.7	
	Over weight	43	82.7	9	17.3	
	Obese	56	67.7	18	32.3	
Socioeconomic Status	Upper Class	5	62.5	3	37.5	**0.024***
	Upper middle class	34	70.8	14	29.2	
	Middle class	39	90.7	4	9.3	
	Lower middle class	63	70.8	26	29.2	
	Lower class	45	86.5	7	13.5	

***Chi-square test; #Fisher's exact test**

Association between recurrences of chronic wound patients and sociodemographic characteristics: Males experienced a higher recurrence rate compared to females, and SC/ST individuals exhibited more recurrent wounds than those from general category. Daily-wagers and obese individuals also showed higher recurrence rates compared to homemaker and normal-weight respondents, respectively. This table explores the recurrence of chronic wounds, highlighting significant associations ($p<0.05$) with gender, caste, occupation, and body mass index **(Table -5).**

Table -5: Association of sociodemographic variables with recurrences of chronic wounds of respondents

Variables		Recurrent of chronic wounds				P-value
		Yes		No		
		No.	%	No.	%	
Age Group	20-39	23	44.2	29	55.8	0.372*
	40-59	54	38.0	88	62.0	
	≥ 60	14	30.4	32	69.6	
Gender	Male	86	41.5	121	58.5	**0.004***
	Female	5	15.2	28	84.8	
Religion	Hindu	83	37.4	139	62.6	0.553*
	Muslim	8	44.4	10	55.6	
Place of Residence	Rural	56	37.1	95	62.9	0.730*
	Urban	35	39.3	54	60.7	
Type of Family	Nuclear	70	35.7	126	64.3	0.138*
	Joint	21	47.7	23	52.3	
Education	Illiterate	8	25.0	24	75.0	0.063*
	Primary/Middle	25	51.0	24	49.0	
	10th/12th	29	32.6	60	67.4	
	UG/PG	29	41.4	41	58.6	
Caste	General	27	33.8	53	66.2	**0.047***
	OBC	47	35.9	84	64.1	
	SC/ST	17	58.6	12	41.4	
Occupation	Unemployed	5	41.7	7	58.3	**<0.001***
	Home maker	4	13.3	26	86.7	
	Farmer	8	24.2	25	75.8	
	Daily-wager	18	60.0	12	40.0	
	Gov./Private Services	22	31.9	47	68.1	
	Business	34	51.5	32	48.5	
Marital Status	Married	83	36.6	144	63.4	0.071#
	Others	8	61.5	5	38.5	
Body Mass Index	Under weight	8	36.4	14	63.6	**0.017***
	Normal weight	25	27.2	67	72.8	
	Over weight	32	61.5	20	38.5	
	Obese	36	48.6	38	51.4	
Socioeconomic Status	Upper Class	5	62.5	3	37.5	0.147*
	Upper middle class	23	47.9	25	52.1	
	Middle class	16	37.2	27	62.8	
	Lower middle class	33	37.1	56	62.9	
	Lower class	14	26.9	38	73.1	

***Chi-square test; #Fisher's exact test**

. The distribution of type of chronic wounds indicates that the chronic wounds are found approximately equal proportion in diabetic foot ulcer as well as venous ulcer while the distribution of site of chronic wound indicates that the majority of chronic wounds are identified within the lower leg/ankle followed by the foot (Fig 1A & B). Additionally, highest proportion (77.5%) was found in the single number of chronic wounds. The recurrences of chronic wound are observed in 37.9% of study population, it showing the significant presence among the chronic wound patients (Fig 1C & D).

Fig.-1 (A): Characteristics of type of chronic wounds

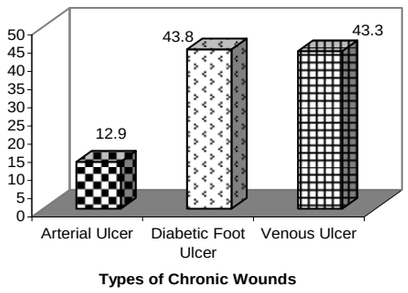

Fig.-1 (B): Characteristics of site of chronic wounds

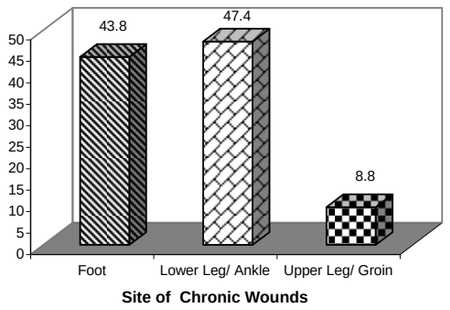

Fig.-1 (C): Distribution of number of chronic wounds

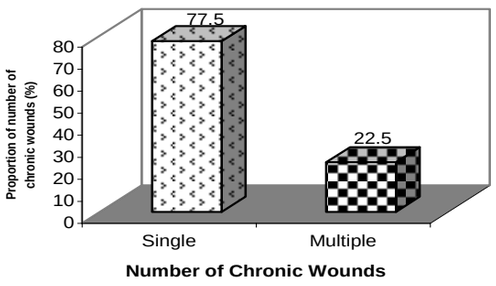

Fig.-1 (D): Distribution of recurrences of chronic wounds.

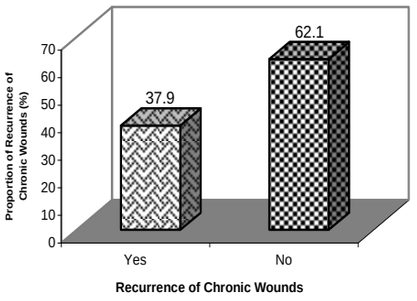

Figure-1: Type and site Characteristics and number, recurrences distribution of CWs. (A) Characteristics of type of chronic wounds, (B) Characteristics of site of chronic wounds, (C) Distribution of number of chronic wounds, (D) Distribution of recurrences of chronic wounds.

Discussion

Chronic wounds present a significant public health challenge globally, characterized by prolonged healing times and associated complications across both developing and developed nations[17-20]. This study highlighted the socioeconomic and clinical-epidemiological profiles related to chronic wounds. Their study underscored the significance of pain and the presence of arterial diseases among individuals with chronic wounds in Brazil[21]. Similarly, another study projected a notable increase in chronic wounds due to the aging global population, estimating that by 2025, the worldwide diabetic population will surpass 400 million, with Asia, Africa, and South America experiencing the most substantial increases[22]. Given these concerns, there is an urgent need to investigate the socio-demographic profiles and associated factors of chronic wounds in various global contexts, including India. Therefore, this cross-sectional study aimed to explore these aspects among 240 patients receiving care at a tertiary hospital in Eastern Uttar Pradesh, India. The majority of our study participants were male, reflecting a higher proportion of chronic wounds among men. This finding is consistent with previous studies that have highlighted gender disparities in chronic wound proportion, often attributed to occupational hazards and lifestyle factors that predispose men to injuries[23].

The predominance of Hindu religion and nuclear family structures among our participants aligns with regional demographics and cultural norms in Eastern Uttar Pradesh, India[24]. Rural residency was prevalent in our study, indicating potential disparities in healthcare access and chronic wound management resources between rural and urban settings. This finding is consistent with previous study primary challenges arises from geographical disparities, where specialized wound care facilities tend to be concentrated in urban areas, leaving chronic wound patients in remote or rural locations with limited accessibility.[25] This spatial divide exacerbates the struggle for chronic wound patients to obtain timely and specialized care, thereby compounding the difficulties they face in addressing chronic wounds. Our findings underscored significant associations between demographic factors and types of chronic wounds. Younger adults (20-40 years) were more susceptible to venous ulcers, possibly due to lifestyle factors and occupational hazards affecting venous circulation. These findings are showing a contrast results due to the differences in methodology, sample size, and operational definition used. In contrast, diabetic foot ulcers were more prevalent in older adults (≥60 years), reflecting the impact of age-related comorbidities such as diabetes and vascular disease. These findings are showing a contrast results due to the differences in geographical location, sampling, and operational definition used[26].

Married are more likely to have a diabetic foot ulcer as compared to the others (unmarried and divorced). Possibly due to the lifestyle factors and not aware about the diabetic foot ulcer. This finding is consistent with previous study and it stands out that many elders with diabetic foot ulcers depend on others to carry out their daily activities and to exchange their wound dressings, which offers married individuals the safety and the support to care for themselves[27]. Educational attainment emerged as a determinant of wound type distribution, with higher proportion of venous ulcers observed among Primary/Middle education level. This association may reflect poor awareness and self-care practices among individuals with primary/middle education levels. This finding is consistent with previous study[28]. Understanding the socio-demographic and clinical epidemiology of chronic wounds is crucial for tailoring effective healthcare interventions. Our findings suggest the need for targeted educational campaigns and accessible healthcare services, particularly in rural areas where chronic wound prevalence is high and access to specialized care may be limited.

Conclusion

In conclusion, this study provides valuable insights into the socio-demographic factors influencing chronic wounds in Eastern Uttar Pradesh, highlighting the complex interplay of age, gender, education, and socio-economic status. Addressing these factors through targeted healthcare interventions is essential for improving outcomes and reducing the burden of chronic wounds in the region.

Limitations and Future Directions: This study includes only those patients who sought treatment at this health facility. Due to cross-sectional nature of the study, it does not establish a cause and effect relationship. Since all responses were provided by the respondents themselves, there may be recall bias, socially acceptable responses given to prevent embarrassment, and possible inaccuracy of self-report. Future research could include longitudinal studies to explore the long-term outcomes of chronic wound management strategies and further investigate the impact of sociodemographic disparities on wound healing trajectories.

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