

## Prevalence of Musculoskeletal Disorders and its Correlation to Physical Activity among Geriatrics Population in Rural Wardha- A Cross-Sectional Study

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### ABSTRACT

**Objective:** Musculoskeletal disorders which leads to the pain in the neck, shoulder, upper back, lower back, knee or other skeletal areas, are instances of musculoskeletal strains. Musculoskeletal problem is the main region of morbidity and the secondly cause of disability in all world. Any action of the body involving the skeletal muscles that results in a modest to high energy expenditure is referred to as physical activity (PA). This study's aim was to determine the prevalence of musculoskeletal illnesses and how physical activity among senior age groups relates to those disorders. This study aimed to determine the prevalence of musculoskeletal disorders, the level of physical activity using a short-form physical activity questionnaire, and the relationship between the prevalence of these disorders and physical activity.

**Material and Methods:** From October 2021 to August 2022, a cross-sectional study of 152 geriatric patients in a rural Wardha was conducted using pre-structured and pre-designed questionnaires. These included demographic information, a short form of the International Physical Activity Questionnaire to gauge the level of physical activity, and standardized Nordic questionnaires to examine musculoskeletal symptoms.

**Results:** Our survey shows 95.3% of elderly people reported musculoskeletal problems. The age groups 60-70 years of geriatrics had the highest prevalence of MSDs (55.19%), significantly higher than those of 70-80, 80-90, and 90-100 years of geriatrics (p 0.05). There is a substantial correlation between the degree of physical activity and the musculoskeletal disorder; the majority of the participant had a moderate level of physical activity (55.9%), with the knee being the most frequently reported region (61.18%).

**Conclusions:** In this study, there are more musculoskeletal diseases among female individuals from rural Wardha than among male participants. Geriatrics between the ages of 60 and 70 had a higher MSD prevalence than those between the ages of 70- 80 or 80-90. The body component most affected was the knee, followed by the lower back and upper back. The majority of the affected senior population engaged in moderate physical activity

**Keywords:** musculoskeletal diseases, physical activity, disability, chronic pain, geriatrics

### INTRODUCTION

An individual may experience neck, shoulder, lower back, or other skeletal pain or strain, which is referred to as a musculoskeletal condition (MSD) (1). According to years lived with disability (YLDs), musculoskeletal disorders (MSDs) are one of the main causes of morbidity and the second most common cause of disability worldwide, with low back pain being the most prevalent ailment. MSDs strain society in terms of direct expenditures to the healthcare system and indirect costs from lost productivity and employment (1).

Any movement involving the skeletal muscles that results in a modest to high energy expenditure is referred to as physical activity (PA) (2). PA provides a wide range of health advantages and helps fend off many chronic and incapacitating illnesses. The cardiovascular, endocrine, bone, and musculoskeletal systems are only a few of the organs and systems that PA can impact (3,4). Additionally, PA reduces mortality, morbidity, and the chance of developing MSDs while enhancing general health, quality of life, and musculoskeletal fitness (3, 5). It has been demonstrated that musculoskeletal pain is more commonly connected with low levels of PA. However, it has shown that a more severe form of MSDs is linked to psychological and social aspects (6,7).

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This has an impact on a wide range of people's quality of life, including those who are different ages, especially geriatrics, professions, and nationalities (7).

Over the years, compelling information about the health advantages of regular physical activity has been obtained (8–10). Chronic diseases, such as heart disease, stroke, chronic respiratory diseases, cancer, and diabetes, which are the main cause of premature mortality and disability, can be prevented, both primary and secondary, through physical activity (11–13). Regular exercise lowers the risk of anxiety and depression (14–16), enhances well-being (17–18), and improves the quality of life (19–21), according to multiple research. Additionally, it has been suggested that physical activity is a standalone predictor of effective aging (22–24). In order to prevent diseases and maintain functional capacity, which ensures independence, physical activity is crucial for older individuals. This has helped to systematically enhance the amount of research on the impact of various physical training treatments on the health of middle-aged and elderly individuals (25–27). Musculoskeletal problems can be prevented and reduced in populations of all ages by engaging in physical exercise (28–31). However, this is particularly crucial for professionals, as musculoskeletal pain can impair their ability and capacity to function (32,34). Musculoskeletal disorders (MSD), which affect the joints, muscles, ligaments, nerves, tendons, and systems that support the neck and back, are more common as people age (35). The relationship between physical activity and musculoskeletal problems in the senior age group should therefore get specific consideration. The need to create a policy encouraging and sustaining employment at an older age is implied by the rapid aging of populations. The idea of labor ability should be recognized as a result. Improved job ability is influenced by a variety of lifestyle factors, particularly, frequent physical activity. The World Health Organization created and disseminated the Global Recommendations on Physical Exercise for Health to establish the recommended minimum level of health-related physical activity (WHO). These recommendations state that adults and older people should exercise for at least 150 minutes per week in a moderate intensity or 75 minutes in a vigorous intensity (36). This study examines the prevalence of MSDs among health professionals in the geriatric age group and the relationship between MSDs and physical activity. The majority of studies that confirmed the relationship between health-related physical activity and workability and musculoskeletal disorders used the subjective method of physical activity assessment (questionnaires, self-assessment).

## MATERIALS AND METHODS

It was a cross-sectional village-based study conducted by using a pre-structured and pre-designed questionnaire. The study was conducted in 6 villages (WaigaonNipani, Pipari, Rohana, Karla, Selukate, Injhapur) of the Wardha district. The study participants were above 60 years of the geriatrics population of rural Wardha both male and female sex. The study period was carried out from October 2021 to August 2022. Inclusion criteria, the participants 60 years or above who will be included in this study and participants who are not on illness are included in this study. Exclusion criteria include those who will not be willing to participate and, at the time of the visit, those who will not be present.

Sample size of the study was 152 participants included in this study. Non-random purposive sampling methods are used for this study. Data will be collected from 6 villages from Wardha district and house to house survey will be done based on international physical activity questionnaires-short form (IPAQ SF) and standardized nordic questionnaires (NMQ) for geriatric population. Kobo tools approach was used to collect the data, which was then entered into Microsoft Excel 2016 and subjected to statistical analysis using the SPSS program version 22.

## RESULTS

**Table 1** shows that out of 152, 66 study participants were males and 86 were females with the percentage of 43.5% and 56.5%, respectively. Most of the participants were 60-70 years of age which is 82(53.9%) followed by 70-80 and 80-90 years of age, with 53(34.9%) and 14(9.3%), respectively. Most of the participants were illiterate, which is 76 (50%) in primary school, high school, and middle school, followed by 36(23.7%),16(10.6%), and 14(9.3%), respectively. Most of the participants were homemaker/unemployed, which is 106 (69.8%). Most of the participants had a moderate level of physical activity (55.9%).

**Table 1:** Demographic characteristics of participants

Variable	Number	Percentage
<b>Gender</b>		
Male	66	43.5%
Female	86	56.5%
<b>Age</b>		
60-70	82	53.9%
70-80	53	34.9%
80-90	14	9.3%
90-100	3	1.9%
<b>Marital status</b>		
Married	111	73.1%
Never Married	1	0.6%
Widowed	40	26.3%
<b>Highest Education</b>		
Graduate	5	3.2%
High school	16	10.6%
Illiterate	76	50%
Intermediate/diploma	5	3.2%
Middle school	14	9.3%
Primary school	36	23.7%
<b>Occupation</b>		
Business	6	3.9%
Daily Wage Labourer	13	8.6%
Farmer	26	17.1%
Homemaker/Unemployed	106	69.8%
Other	1	0.6%
<b>Physical activity level</b>		
Low	41	26.9%
Moderate	85	55.9%
High	26	17.2%

95.3% of all participants reported experiencing pain in the previous year. 28.2% of them felt the pain that made it difficult to work. Knee (61.18%), lower back (50.00%), and upper back (33.55%) were the body parts where the pain was most frequently reported in the past 12 months, and these complaints were said to hinder with employment (**Table 2**).

A significant relationship between MSDs and PA level was found (P 0.02\*); 54.5% of participants with a moderate PA level reported having MSDs in the previous year. In addition, 53.5% of participants with low levels of PA experienced MSDs that interfered with their ability to work or perform other daily tasks, as opposed to 54.8% of elderly people with intermediate levels of PA (**Table 3**).

**Table 4**, Shows associations between general characteristics and MSDs. Gender, age, marital status, highest education, and occupation. Shows significance, as 56.55% of those suffering from MSDs were female, 55.19% were 60-70 years of age, 26.20% were widowed, 49.65% were in illiterate, and 68.28% had a homemaker/unemployed.

**Table 5** demonstrates relationships between physical activity level and discomfort in the neck, shoulders, elbows, wrists, hands, upper and lower backs, hips, knees, ankles, and feet. Upper back, lower back, and knee discomfort were all significantly associated with a moderate degree of physical activity ( p values 0.004, 0.002, 0.003, respectively). A no significant association with a moderate level of physical activity was found with neck, shoulder, elbow, wrist/hand, hip/thigh, and ankle/feet pain (p values 0.008, 0.006, 0.007, 0.006, 0.009, respectively).

**Table 2:** Prevalence of Musculoskeletal disorders

Variable	Number	Percentage
<b>Pain during the last 12 months-</b>		
Neck	8	5.26%
shoulder	21	13.82%
elbows	7	4.61%
Wrists/hands	9	5.93%
Upper back	51	33.55%
Lower back	76	50.00%
Hips/thighs	14	9.27%
Knees	93	61.18%
Ankles/feet	10	6.58%
<b>Pain interferes with work</b>		
Neck	1	12.50%
Shoulder	7	33.33%
Elbows	0	0.00%
Wrists/hands	4	44.44%
Upper back	10	19.61%
Lower back	12	15.79%
Hips/thighs	4	28.57%
Knees	17	18.28%
Ankles/feet	3	30.00%

**Table 3:** Associations between musculoskeletal disorders and level of physical activity

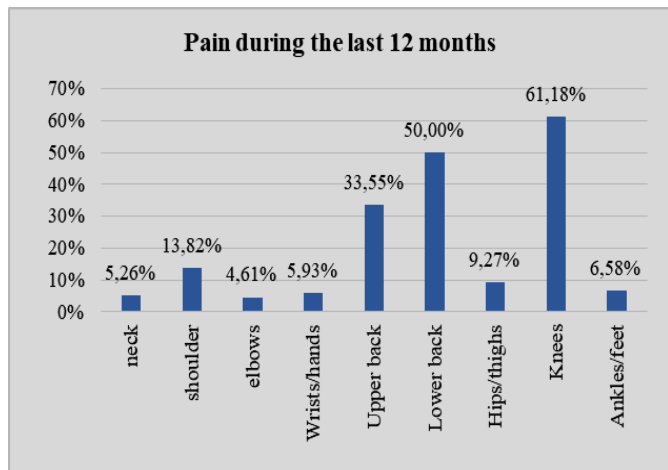
Level of physical activity			Chi-square	P-value
	Pain during the last 12 month			
	YES	NO		
<b>Low</b>	40(27.6%)	1(14.3%)	2.858	0.002
<b>Moderate</b>	79(54.5%)	6(85.7%)	-	-
<b>High</b>	26(17.9%)	0(0.0%)	-	-
	Pain interferes with work			
	YES	NO		
<b>Low</b>	23(53.5%)	18(16.5%)	21.43	0.004
<b>Moderate</b>	15(34.9%)	70(64.2%)	-	-
<b>High</b>	5(11.6%)	21(19.3%)	-	-
	Pain during the last 7 days			
	YES	NO		
<b>Low</b>	39(27.1%)	2(25.0%)	2.006	0.003
<b>Moderate</b>	79(54.8%)	6 (75.0%)	-	-
<b>High</b>	26(18.1%)	0(0.0%)	-	-

**Table 4:** Association between general characteristics and musculoskeletal disorders

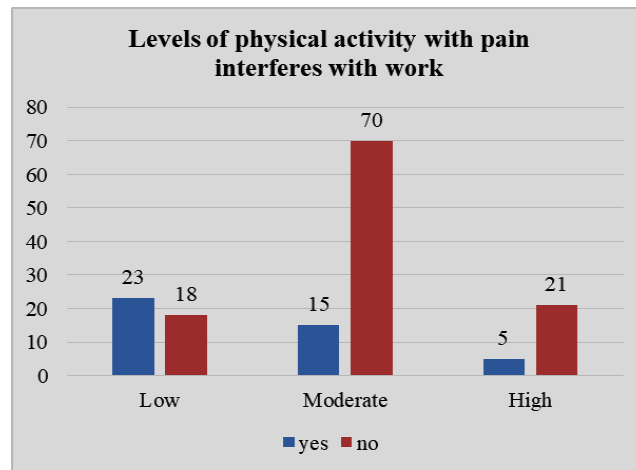
Pain during the last 12 months-				Chi-square	p-value
		YES	NO		
Gender	male	63(43.45%)	3(42.85%)	0.0009498	0.019
	female	82(56.55%)	4(57.15%)		
Age	60-70	80(55.19%)	2(28.57%)	10.12	0.017
	70-80	51(35.19)	2(28.57%)		
	80-90	11(7.50%)	3(42.86%)		
	90-100	3(2.12%)	0(0%)		
Marital status	married	106(73.10%)	5(71.43%)	0.06503	0.004
	Never married	1(0.7%)	0(0%)		
	widowed	38(26.20%)	2(28.57%)		
Highest education	graduate	5(3.44%)	0(0%)	1.135	0.018
	High school	15(10.34%)	1(14.28%)		
	illiterate	72(49.65%)	4(57.16%)		
	Intermediate/diploma	5(3.44%)	0(0%)		
	Middle school	13(8.96%)	1(14.28%)		
occupation	Primary school	35(24.13%)	1(14.28%)	3.184	0.042
	Business	6(4.14%)	0(0%)		
	Daily wage labourer	13(8.97%)	0(0%)		
	Farmer	26(17.94%)	0(0%)		
	Home maker/unemployed	99(68.28%)	7(100%)		
	other	1(0.68%)	0(0%)		

**Table 5:** Association between neck, shoulder, elbow, wrist/hand, upper back, lower back, hip/thigh, knee, ankle/feet pain, and physical activity level

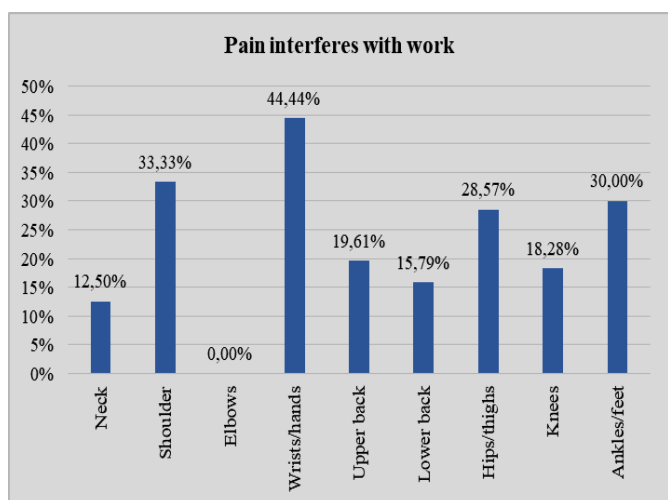
Level of physical activity			Chi-square	P-value	
	YES	NO			
Pain in the Neck during the last 12 months	low	2(25%)	39(27.1%)	0.3728	0.008
	moderate	4(50%)	81(56.3%)		
	high	2(25%)	24(16.6%)		
Pain in the shoulder during the last 12 months	low	5(23.8%)	36(27.5%)	0.7853	0.006
	moderate	11(52.4%)	74(56.5%)		
	high	5 (23.8%)	21(16.0%)		
Pain in the Elbow during the last 12 months	low	3(42.86%)	38(26.20%)	0.9444	0.007
	moderate	3(42.86%)	82(56.55%)		
	high	1(14.28%)	25(17.25%)		
Pain in the wrist and hand during the last 12 months	low	1(11.11%)	40(27.97%)	2.365	0.006
	moderate	5(55.55%)	80(55.94%)		
	high	3(33.34%)	23(16.09%)		
Pain in the upper back during the last 12 months	low	17(33.33%)	24(23.76%)	2.445	0.004
	moderate	28(54.91%)	57(56.43%)		
	high	6(11.76%)	20(19.81%)		
Pain in the lower back during the last 12 months	low	24(31.57%)	17(22.37%)	2.302	0.002
	moderate	38(50.00%)	47(61.84%)		
	high	14(18.43%)	12(15.79%)		
Pain in the one or both hips and thighs during the last 12 months	low	6(40.00%)	35(25.54%)	1.453	0.008
	moderate	7(46.66%)	77(56.21%)		
	high	2(13.34%)	25(18.25%)		
Pain in the one or both knees during the last 12 months	low	29(31.18%)	12(20.34%)	2.37	0.003
	moderate	48(51.61%)	37(62.72%)		
	high	16(17.21%)	10(16.94%)		
Pain in the one or both ankles and feet during the last 12 months	low	3(30%)	38(26.77%)	0.1559	0.009
	moderate	5(50%)	80(56.33%)		
	high	2(20%)	24(16.90%)		



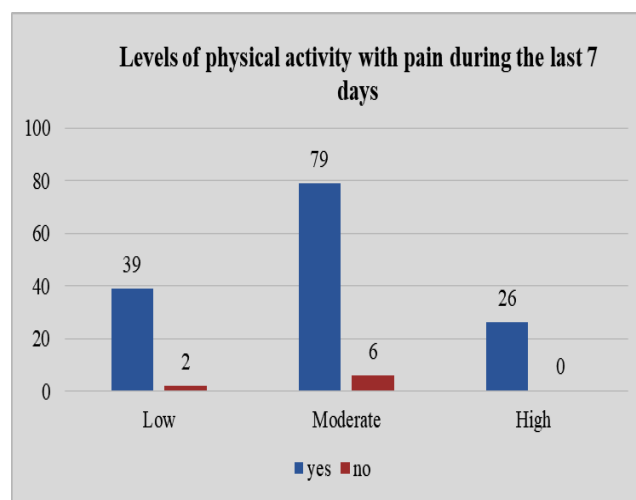
**Figure 1:** From above graph shows the pain during the last 12 months according to the Presenting site.



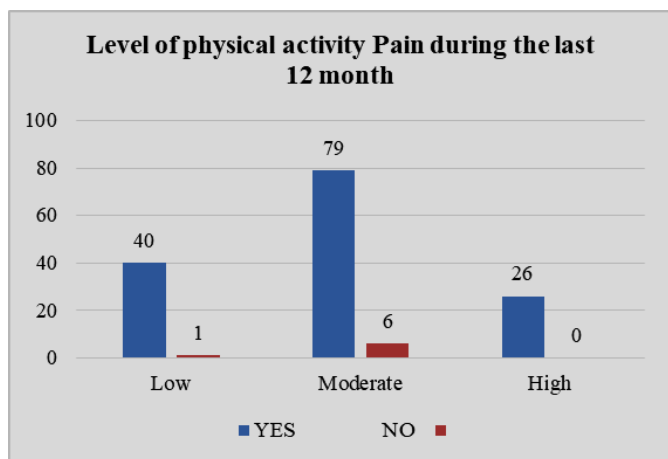
**Figure 4:** From above chart shows that the level of physical activity with pain interferes with work.



**Figure 2:** From the above graph shows the site of pain and interference with work



**Figure 5:** From above chart shows that the level of physical activity with pain during the last 7 days.



**Figure 3:** From above chart shows that the level of physical activity with pain during the Last 12 months.



## DISCUSSION

In this study, we discovered a significant prevalence of MSDs, with 95.3% of the geriatrics reporting at least one body location of musculoskeletal pain or discomfort. The knee (61.18%) was the most often reported region, followed by the lower back (50.00%) and the upper back (33.55%), which was frequently linked to job avoidance and was more frequent in recent days, particularly for knee pain. The highest prevalence of MSDs was among 60-70 years of geriatrics age groups (55.19%), which was significantly higher than among 70-80, 80-90, and 90-100 years of geriatrics age groups ( $p < 0.05$ ). The prevalence of back pain was 66% in men and 86% in women over 12 months in another study. The prevalence of pain in the extremities was 63% in men and 78% in women, while the prevalence of back/extremity pain was 75% in men and 91% in women (37). In another study, the frequency of osteoarthritis was 24.1% and higher in females. Study also found that 14.6% of senior people had musculoskeletal issues, with arthritis of the knee joints affecting 8.42% of men and 17.3% of women and spondylitis affecting 2.6% of men and 2.7% of women (38). The pain was prevalent during the time in the back (including the lower back, thoracic, and neck) by 76% and in the extremities by 71%.

Another study found that the lowest site-specific prevalence was in the low back (70%), followed by the knee (46%), neck (44%), leg/calf (39%), and mid-back (39%) (37). Our study showed females to have a higher incidence of MSDs, which was significant ( $p = 0.019^*$ ), as it has been in many other investigations. Additionally, we discovered that MSDs were less common in people with high school, middle school, graduate, and intermediate/diploma education, and more common in those with illiteracy (49.65%), primary school education (24.13%), and higher education ( $p = 0.018^*$ ). In our study, we also discovered that MSDs were less common in daily wageworkers, business owners, and other groups ( $p = 0.042^*$ ), and more common in home-makers and the unemployed (68.28%) and farmers (17.94%).

The onset of MSDs is influenced by physical inactivity. Numerous studies have cited low levels of physical exercise as a primary contributor to MSDs. In our study, just 17.2% of the elderly exhibited high levels of physical activity, compared to 55.9% of moderately active elderly and 26.9% of slowly active elderly. Unpredictably, we discovered that the prevalence of Musculoskeletal disorders was higher in elderly people with a moderate level of PA (54.5%),

lower in elderly people with a low level of PA (27.6%), and only 17.9% in elderly people with a high degree of PA. In a related study, women aged 50 to 64 were shown to have important relationships. More physically active people reported less musculoskeletal issues in the shoulder and ankle/foot regions (39). A substantial correlation between PA and the outcome of LBP was found in a different study that examined the number of leisure hours per week spent engaged in walking, mild, moderate, and severe physical activity at each of four assessment points. In a related study, we discovered that women in India who nearly never engaged in the moderate physical exercise had a 29% higher risk of experiencing back discomfort (40). Only among women in India was there a significant correlation between back

discomfort and walking, with the odds being 26% and 33% higher for walking frequently and nearly never, respectively (40). Another repeated PA measures study found that the medium exercise group, as opposed to the low and high exercise groups, had the highest percentage of women reporting prior episodes of acute/subacute NSLBP during the preceding five years, at 66%. (41) In none of the nations did men's back discomfort significantly correlate with engaging in vigorous physical exercise (40). In India, participating in light exercise a few days a week and rarely was linked to 38% and 56% higher probability of reporting back pain, respectively (40). This, we hypothesize, may account for the reduced prevalence of MSDs observed in our study's geriatric population groups aged 70-80, 80-90, and 90-100.

### Limitations

- Despite the fact that the study's objectives were met, there were certain restrictions. It is less accurate to use IPAQ-SF to predict physical activity levels than the original method.
- Recall bias is the main limitations of this study since it was a cross-sectional study conducted in a village where it was difficult to recall the time period of musculoskeletal diseases during the previous six months.

### Recommendations

- Recommendations Monthly orthopedic health checks can be made at every health care facility for early detection of musculoskeletal problems in the geriatric age group.
- Health education as a strategy for primary level of prevention of musculoskeletal disorders may be useful to prevent complications.

## CONCLUSION

According to the study, there are more musculoskeletal diseases among female individuals from rural Wardha than male participants. Geriatrics between the ages of 60 and 70 had a higher MSD prevalence than those between the ages of 70 and 80 or 80 and 90. The body component most affected was the knee, followed by the lower back and upper back. The majority of the affected senior population engaged in modest physical activity. We discovered that MSDs were more common among illiterate people (49.65%), followed by people with only primary school education, and were less common among people with high school, middle school, graduate, and intermediate/diploma education. MSDs were more common in homemakers and jobless people, followed by farmers, and less common in daily wage workers, business owners, and others. In our study, just 17.2% of the elderly engaged in vigorous exercise, compared to 55.9% of the moderately active elderly and 26.0 % of the weakly active elderly. MSD prevalence was higher in senior individuals with moderate PA, lower in elderly individuals with low PA, and only 17.9% in elderly individuals with high PA.

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**Author Contributions: SB, SS;** designed of the study, data collection and analysis. **SB;** submission of the manuscript and revisions

**Ethical approval:** All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and/or with the Helsinki Declaration of 1964 and later versions. Informed consent or substitute for it was obtained from all patients for being included in the study. Written consent was obtained from each patient to use their hospital data.

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