INTEGRAL INSTITUTE OF MEDICAL SCIENCE AND RESEARCH, INTEGRAL UNIVERSITY, LUCKNOW

"A Study of Prescription Pattern in Musculoskeletal Disorders causing Low Back Pain (LBP) in a Tertiary Care Teaching Hospital in Northern India"

A

DISSERTATION

SUBMITTED TO – INTEGRAL UNIVERSITY

In partial fulfilment of the requirements for the award of a degree of

Master of Science

In

Medical Pharmacology

By- Dr. Abdul Waseem Khan

Enrollment No: 2100101364

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DECLARATION OF CANDIDATE

I hereby declare that this dissertation entitles **"A Study of Prescription Pattern in Musculoskeletal Disorders causing Low Back Pain (LBP) in a Tertiary Care Teaching Hospital in Northern India"**is bonafide & genuine research work carried out by me under the guidance of **Dr. Kauser Sayedda**, Professor, Department of Pharmacology, Integral Institute of Medical Sciences & Research, Lucknow.

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This is to certify that research work entitled **"A Study of Prescription Pattern in Musculoskeletal Disorders causing Low Back Pain (LBP) in a Tertiary Care Teaching Hospital in Northern India"** submitted by **Dr. Abdul Waseem Khan** for ethical approval before the Institutional Ethics Committee IIMS&R. The above mentioned research work has been approved by Institutional Ethics Committee, IIMS&R with consensus in the meeting held on **30th December 2022**.

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Introduction

Movement and function of our body is complex play of bones, Muscle, Nerves, Tendons and Ligaments. The lower back carries the weight of the body making it more prone to injury. The greater part of the movement in the lumbar spine is at L3-L4 and L4-L5, so these part of spine are highly prone to break down from various causes like Degenerative diseases, Inflammatory spine conditions, Spondylitis etc.(1) Lower two that ransmits through the leg and down to the foot (sciatica). Muscle strain accounts for the vast majority of episodes of lower back pain. While a muscle strain doesn't seem like a serious injury, it can prompt issues in the lower back causing extreme suffering. The reality that soft tissues have a fair blood supply, which carries nutrients to the harmed region, works with the recuperating system and frequently gives compelling help of the back aggravation.(1,2) Low back pain is one of the most prevalent conditions in our society and is an epidemic in India. It is the most common cause of medical office visits, surgical procedures, and work-related disability.

According to analysis of the Global Burden of Disease (GBD) 2019 data, approximately 1.71 billion people worldwide suffer from musculoskeletal conditions, such as low back pain, Osteoarthritis, Fractures, Cervical pain, Amputation and several other injury.(3) Low back

pain is the primary cause of the overall burden of musculoskeletal conditions, accounting for

570 million prevalent cases worldwide and 7.4% of global YLDs (years lived with disability

This number had expanded by 63% from 1990 to 2019. With 610 million people [588–636]

and 83 million YLDs [62–106] in need of rehabilitation services,

Maximum strain occurs at lower two segments L4, L5 & L5, S1 and there is much possibility

of bulging it out resoling in excruciating pain in lower back, tingling and numbness. the

Western Pacific region was the most severely affected. The sickness region that contributed

most to predominance was outer muscle problems (1•71 billion individuals [1•68-1•80]), with

low back torment being the most common condition in 134 of the 204 nations broke down.(

P2006-2017, 19 DECEMBER 2020 Projections show that the quantity of individuals with

low back torment will increment later on, and, surprisingly, more quickly in low-pay and

center pay nations (4-6). The Worldwide Weight of Sickness (GBD) Study is refreshed each

one to two years (7,8). One of the musculoskeletal conditions included in the GBD study is

LBP; the GBD 2010 (9) analysis served as the basis for the most recent article detailing the

global burden of LBP.

It is the main reason of movement restriction and non-attendance from work (10,11), and

brings about an enormous clinical weight and financial expense. It is thusly one of the major

worldwide general medical conditions (12,13)

LBP was characterized as agony that goes on for somewhere around one day (with/without torment alluded into one or both lower appendages) nearby on the back part of the body from the lower edge of the 12 ribs to the lower gluteal folds (14-16)

The existence time prevalence of low back torment is accounted for as more than 70% in industrialized nations (one year commonness 15% to 45%, grown-up rate 5% each year). The prevalence rate approaches that of adults during school years, rising from childhood to adolescence and reaching its highest age range of 35 to 55. Around 66% of individuals are probably going to encounter relapse of agony within of a year, and around a third are probably going to have relapse of work nonappearance. (17)

Low back agony can emerge from many causes. It can be anything from a dull, irritating ache to total agony. Non-specific low back pain affects more women than men. Expanding age, weighty actual work, truly difficult work, contorting, psycho factors, wretchedness, stoutness are the normal inclining factors. Mechanical lumbar syndromes are typically exacerbated by levered postures, long lever activities (like vacuuming or working with the arms raised and away from the body), and static loading of the spine (like prolonged sitting or standing).

76% of back strain and/or sprain claims are made by metal workers, according to the Bureau of Labor and Statistics. More than half of all back pain complaints come from jobs that require a lot of manual labor and material handling. Truck drivers, heavy equipment operators, and construction workers suffer the most back injuries. (18) To maintain health, movement helps the disks exchange fluid and nutrients. Additionally, pain can be alleviated by stretching the piriformis muscle, where the sciatic nerves are located. The soft gel may protrude from the disc if there is a tear in its outer structure. By practices the external covering annulus can be reinforced and there by diminishes the aggravation. The muscles that support the spine should be strengthened and stretched during back strengthening exercises. Flexibility and strengthening exercises for the back not only help the back avoid injury or reduce the severity of injury if the spine is traumatized, but they can also help alleviate the pain caused by a variety of back conditions. It strengthens the muscles, ligaments, and tendons that support the spine and the spinal column. The vast majority of the back practices centre around the back, yet in addition the abs and gluteus and hip muscles. Because they maintain the spine's alignment and facilitate movements that extend or twist the spine, these strong core muscles can help alleviate back pain. It is extremely important to give practice as one of the nursing mediations to decrease low back torment. (19)

There is an expansive scope of possible etiologies for both grown-up and paediatric patients. The etiologies vary contingent upon the patient populace, however most usually, it is mechanical or vague. Not all back pain is lumbago or paraspinal muscle hypertonicity. The mechanical back is both pervasive and with an enormous frequency. Providers are ignoring a significant portion of cases by concentrating solely on the causes of back pain that are both the most prevalent and the most dangerous. Up to 30% of mechanical back pain, according to some sources, is caused by the sacroiliac joint, but it is often overlooked in a differential

diagnosis. 20) . Instances of ankylosing spondylitis are missed when suppliers expect back a patient's back torment to be mechanical (21).

Incendiary issues, threat, pregnancy, injury, osteoporosis, nerve root pressure, radiculopathy, plexopathy, degenerative disc illness, disc protrusion, spinal stenosis, sacroiliac joint stiffness, joint injury, and disease are all essential for the differential. An essential first step in diagnosing back pain is to distinguish between neuropathic pain (radiculopathy) and nociceptive pain (mechanical). Exceptional tests, for example, the straight leg raise or Patrick's test can be utilized to assist with separating the beginning of the patient's back aggravation. Back pain can be a problem that lasts from childhood into adulthood and is a major cause of disability. Back torment is a huge supporter of morbidity and mortality. Persistent back pain is likewise the most widely recognized reason for constant agony overall.

The two most significant viewpoints in the administration of back pain are the distinguishing proof of warnings that could be disturbing for determinations, for example, threat or neurological circumstances, for example, caudaequina condition (22). It is fundamental to have the option to assess patients of any age and figure out the extraordinary contrasts in the show in these various populaces. The provider can direct the patient toward the appropriate evaluation and treatment if they are aware of the typical warning signs of back pain, such as weakness, bowel or bladder incontinence, or pain that wakes patients from sleep in both children and adults. Rest and time will typically alleviate most cases of back pain.

Back torment is and likly will keep on being the focal point of numerous suppliers due to its the significant impact on patients' prosperity. Capability becomes weakened, activities of everyday living are changed to oblige back agony, and personal satisfaction endures. Back pain and axial skeletal injuries affect almost every aspect of life, in contrast to injuries to

almost every other part of the body. For instance, it is difficult to sleep, it is difficult to bend, reach, or turn, it is difficult to drive or get to work, lifting and exercise become strenuous, it is difficult to walk to the bathroom, and so on.

Rest, aspirin, physical therapy, and instruction are all components of conventional medical treatment. Gastrointestinal, Kidney, and potential cardiovascular Adverse drug reactions should be considered with prolong NSAID, use. The United States has the highest estimated rate of surgical treatment for lumbar syndromes, with rates at least 40% higher than those in other nations and more than 5 times higher than those in Scotland and England. These medical procedures can deliver wounds to the back spinal muscles and their nerve supply, which might be a hotspot for proceeded with loss of capability and sufferings.

There are very few studies that have looked at the pattern of prescriptions for LBP, especially in India. The point of our review was to investigate the patients with low back pain (LBP), separation of patients as to orientation , financial status and agony seriousness status. In particular, we looked at the patterns of prescriptions and the number of LBP patients treated with at least one pain medication in this Tertiary Care Teaching Institute in Northern India. Additionally, our goal was to ascertain the patterns and frequencies of prescribed co-medications in the treatment of acute LBP.

Review of Literature

A survey of the available research lays the groundwork for the study and may spark new ideas to existing ones. Identification, selection, critical analysis, and written descriptions of current data on the subject of interest are all parts of reviewing research literature. The following headings give a review of studies on low back pain and prescription trends.

1. Research on the prevalence and incidence of low back pain.

2. Research on low back pain disability and health-related quality of life

3. Research on prescription medicine trends for low back pain

Studies related to incidence and prevalence of low back pain

Leah J. J, et a., 2007 (23) In order to provide an up-to-date synthesis of the epidemiology of idiopathic adolescent spinal pain, Leah J. J, et al., (2007) conducted an exploratory study to identify the existing research literature. A deliberate meta-blend approach was utilized to recognize optional survey articles and essential epidemiological investigations in regards to idiopathic juvenile spinal torment. There were 56 primary crosssectional studies found. The review report uncovered that spinal or back torment was the most usually announced measure with the existence time pervasiveness figures went from 4.7% to 74.4% and the existence time commonness of low back torment went from 7% to 72%. According to the findings of the study, lifetime prevalence rates rise steadily with age and reach adult levels by around the age of 18.

Ganeshan S et al., 2017(24) According to research carried out in a young adult Indian population, , Indian youth are more likely than Westerners to develop LBP. The study also identified various modifiable and non-modifiable risk factors for LBP in young adults. Early identification of these risk factors will prevent the progression of acute LBP to chronic LBP. Satisfaction with current employment position, monotony, stress, and family history of spine problems were identified as significant predictors of LBP. As persistent LBP can possibly control individual personal satisfaction and increment monetary weight, making mindfulness about the modifiable precipitating factors in youthful grown-up population might prompt way

of life alterations, subsequently working on their personal satisfaction and expanding efficiency.

A prospective cohort study that Rachael. E.D et al., 2011 (25) carried out in Cambridge city to decide the pervasiveness of impairing and no disabling back torment across age in more established grown-ups and to distinguish the precipitating factors. Members matured more than or equivalent to 75 years were consulted. Poisson regression was used to estimate RRs and 95% confidence intervals (CIs). According to the findings of the study, the prevalence of

non-disabling and disabling back pain was 23% and 26%, respectively. The concentrate likewise pointed that the pervasiveness of non-incapacitating back torment didn't shift altogether across age, and with age came an increase in the prevalence of crippling back pain.

New-beginning handicapping and non-impairing back torment at follow-up was 15 and 5%,

separately. At follow-up, these risk factors were found to predict the onset of back pain: poor

health assessment (RR 3.8; 95% CI 1.8, 8.0); burdensome side effects (RR 2.2; 95% CI 1.3,

3.7); utilization of social or medical services (RR 1.7; 95% CI 1.1, 2.7); and back pain in the past (RR 2.1; 95% CI 1.2–3.5). At the end of the follow-up period, 5% and 15% of patients had non-disabling new-onset back pain, respectively. At follow-up, these risk factors were found to predict the onset of back pain: unfortunate self-evaluated wellbeing (RR 3.8; 95% CI 1.8, 8.0); symptoms of depression (RR 2.2; 95% CI 1.3, 3.7); utilization of social or medical services (RR 1.7; 95% CI 1.1, 2.7); and back pain in the past (RR 2.1; 95% CI 1.2–3.5). According to the findings, older adults with low self-esteem, depressive symptoms, increased utilization of health and social services, and a history of back pain are more likely to report experiencing back pain in the future.

Bansal D et al., 2020 (26) revealed that LBP is profoundly common in India. They inferred that women (OR, 2.23; 95% CI, 1.80-2.77; P 0.05), and lifting weights/walking (OR, 1.362; 95% CI, 1.097-1.692; OR, 1.03; P 0.05), and with age (OR, 0.05; 95% CI, 1.02-1.04; P < 0.05) were most huge positive indicators of LBP. Respondents' quality of life is negatively impacted by LBP. As a result, health officials must plan programs for prevention, education, and management in society.

In a 2011 study, Wong WS and Fielding RC (27) evaluated the relationship between chronic pain and socio-demographic and lifestyle factors, as well as the pain characteristics of those who suffer from chronic pain, in the general population of Hong Kong. 5001 adult were

recruited from the study having response rate of 58%. Using telephone interviews, a Chronic Pain Grade (CPG) questionnaire and socio-demographic status were provided. The review uncovered that 34.9% detailed torment enduring over 90 days (persistent agony), having a normal of 1.5 pain sites. The CPG criteria classified 21.5 percent of those with chronic pain symptoms as Grade III or higher. Of those with multiple pain problems, 35.2% experienced multiple pain sites, most commonly in the legs, back, and head. Among those with multiple pain problems, the legs and back were rated as the most significant pain areas. Female gender, older age, part-time employment, existing long-term health issues, higher anxiety scores, and low self-perceived health were all found to be significantly associated with chronic pain in fully adjusted stepwise regression analyses. The study found that Hong Kong's general population suffers from chronic back pain, with women and middle-aged adults experiencing the highest prevalence.

The study by Ganesan S. et al., 2017 (24), LBP in young adults was correlated with marital status, a history of spine problems, vigorous exercise, job satisfaction, monotony, stress, daily study hours, and a family history of spine problems (p 0.05). Nonetheless, age, sex, smoking, liquor abuse, espresso admission, mode and length of movement, diet, recurrence of weightlifting, wearing heels, concentrating on stance, and recurrence and sort of sports exercises were not related with LBP

Jacob T, 2006 (28) directed a local area put together longitudinal concentrate in Israel with respect to low back torment occurrence episodes. A randomized example of people, liberated from low back torment at a past cross-sectional overview were chosen for the review. Back pain history, general health perceptions, physical activity, smoking, job satisfaction, and demographic variables were included in the study's baseline data. According to the findings of the study, the annual incidence of low back pain was 18.4%, and those who had low back pain in the previous year had a lower baseline perception of their overall health and participated in fewer sports activities than those who had no pain. The study came to the conclusion that incident episodes of low back pain are fairly common and have an indirect connection to baseline perceptions of general health and the amount of sporting activities performed.

A review led by Wang et al., 2022 (29) noticed the epidemiological patterns of low back torment at the worldwide, local, and public levels during the time of 1990-2019. The assessed yearly rate changes (EAPCs) in the age-normalized occurrence rates and age-normalized DALY not entirely settled to quantify the fleeting patterns of LBP. He closed The worldwide age-normalized frequency rate and age-normalized DALY pace of LBP showed a descending pattern, particularly in East and South Asia. Additionally, older people and females had a higher prevalence of LBP. The biggest abatements in the age-normalized frequency rate and age-normalized DALY pace of LBP were seen in India, and China.

David C et al., 2005, (30) researchers estimated the prevalence and course of adult episodes of severe graded low back pain. The study used a prospective cohort, population-based design. A mailed survey's respondents formed an incidence cohort of 318 subjects without low back pain and a course cohort of 792 prevalent cases. The Chronic Pain Questionnaire defined incident, recurrent, persistent, aggravated, improved, and resolved episodes. The rate of follow-up at six and twelve months was, respectively, 74% and 62%. Age and sex were standardized in the annual estimates. The review uncovered that the total rate was 18.6% (95% certainty stretch CI, 14.2%-23.0%) and most low back torment episodes were gentle. Just 1.0% (95% CI, 0.0%-2.2%) created extreme and 0.4% (95% CI, 0.0%-1.0%) created impairing low back torment. 26.7 percent (95 percent CI, 23.7%-30.0%) of episodes resolved, while 40.2 percent (95 percent CI, 36.7%-43.8%) remained. The concentrate additionally detailed the seriousness of low back torment expanded for 14.2% (95% CI, 11.5%-16.8%) and improved for 36.1% (95% CI, 29.7%-42.2%). Of those that recuperated, 28.7% (95% CI, 21.2%-36.2%) had a repeat in the span of a half year and 82.4% of it was gentle low back torment. The incidence rate ratio, 0.88; younger subjects had a lower risk of having persistent low back pain. 95% CI, 0.80-0.97) and bound to have goal (frequency rate proportion, 1.26; 95% CI, 1.02-1.56). According to the findings of the study, older adults are more likely to experience episodes of low back pain over time.

Leboueuf YD et al. 1999 (31) conducted a study, to recognize the connection among smoking and frequency and commonness of low back torment. The strength of the association was systematically examined in 41 original research reports that reported 47 studies published between 1947 and 1966. The outcome brought up that there was no consistency of genuinely huge positive relationship among smoking and back torment.

Shiri R et al. 2010 (32) conducted a meta analyses, the authors explore 40 studies—27 cross-sectional and 13 cohort - Current smoking was linked, in cross-sectional studies, to higher rates of low back pain in the past month (OR 1.30, 95 percent confidence interval [CI], 1.16-1.45), low back pain in the past year (OR 1.33, 95 percent CI, 1.26-1.41), seeking care for low back pain (OR 1.49, 95 percent CI, 1.38-1.60), chronic low back pain (OR 1.79, 95 percent CI, 1.27-2.50), and disabling low back pain Previous smokers had a higher prevalence of low back torment contrasted with never smokers, however a lower prevalence of low back torment than current smokers. Low back pain was more common in former smokers (OR 1.32, 95% CI, 0.99-1.77) and current smokers (OR 1.31, 95% CI, 1.11-1.55) in cohort studies than in people who had never smoked. The relationship between current smoking and the occurrence of low back torment was more grounded in young people (OR 1.82, 95% CI, 1.42-2.33) than in grown-ups (OR 1.16, 95% CI, 1.02-1.32). Our discoveries demonstrate that both current and previous smokers have a higher prevalence and incidence of low back torment than never smokers, yet the association is genuinely true. Adolescents are more likely than adults to smoke and experience low back pain more frequently.

Laslett M et al., 1991(33) . carried out An investigation into the prevalence and incidence of low back pain among urban New Zealanders was carried out in A telephone survey was used at random to evaluate 314 subjects. The severity and frequency of referred lower extremity pain, as well as their relationship to other variables like occupation, recreation, age, sex, and predominant working posture, were examined. The review called attention to that point frequency was 17.5%, week by week occurrence 33.4%, yearly rate 63.7% and absolute frequency 79%. 6.4% of people experience frequent severe episodes and 28.3% experience frequent minor episodes of low back pain. The study also found that 50% of people with low back pain have their first episode before they are 30 years old, that 14.3% of people with low back pain have reference below the knee, and that 13.7% of people with low back pain have reference below the knee. Over half (51.6%) experienced pain for less than seven days, while a third experienced pain for more than seven weeks. The review presumed that no connection between's the frequency of low back torment and alluded torment and word related act. Studies on low back pain-related disability and health-related quality of life

Studies related to health related quality of life and disability due to low back pain

Cesar G et al., 2011(34)A study was carried out in 2011 to compare the health-related quality of life (HRQOL) and disability of adolescents with low back pain (LBP) who were

referred to a hospital with those of adolescents without LBP from the general population. It was a paired case-control study. All successive young people with vague LBP alluded to a clinic short term center (cases-patients) between January 2006 and October 2007 were contrasted with two benchmark groups: adolescents with and without LBP from a representative student sample. Two controls from each gathering were haphazardly matched with each case by city of home, sex, and age. Both the cases and the controls completed the same self-administered questionnaires, which included two low back pain-specific instruments—the Roland-Morris Disability Questionnaire and the Hannover Functional Ability Questionnaire—as well as a general quality-of-life instrument (KIDSCREEN-52). A gathering of young people with adolescent idiopathic joint inflammation finishing a similar poll was utilized as outer reference. It was determined that the samples could detect a difference in KIDSCREEN scores of more than 4.68 units. Effect size estimation and t tests were used to make comparisons. The review brought up that Patients (n = 76) had more continuous (P = 0.005) and extraordinary (P < 0.001) LBP than teenagers with LBP in everybody (n = 152) and a less fortunate score on the Roland-Morris (5.5 versus 4.3, P = .023) and Hanover (4.5 versus 3.5, P = 0.032) surveys. The study came to the conclusion that adolescents with LBP who seek specialized medical care report worse clinical and functional status but higher HRQOL than peers with symptoms in the general population.

In Iran, a study on low back pain education and short-term quality of life was conducted by **Sedigheh S T,** 2007 (35) The method was a randomized controlled trial. One hundred and two female low back pain patients (n = 102) were randomly divided into two groups that were comparable in terms of age, weight, education, occupation, socioeconomic status, and some risk behaviors. The "Back School Programme" was given to group 1 (back school group, 50) and group 2 (clinic group, 52). The personal satisfaction utilizing the Short Structure Wellbeing Overview (SF-36) was surveyed at double cross places: at the beginning and three months later. The discoveries were analyzed both inside and between two gatherings. The "Back School Program" was found to be effective in enhancing patients' quality of life, according to the study; For group 1, there were significant differences on all eight subscales of the SF-36. In the facility bunch (bunch 2), improvement was seen on three scales (substantial agony, imperativeness and psychological wellness) yet these enhancements were not exactly in bunch 1. Only three subscales showed significant improvements in group 2: substantial torment (P = 0.001), essentialness (P = 0.02) and

emotional wellness (P = 0.04). The "Back School Programme" group had a significantly better mean improvement across all eight SF-36 subscales. Patients with chronic low back pain might see an improvement in their quality of life over the course of three months if they participate in the "Back School Programme," according to the study.

Tucer B, 2009 (36) directed a review to explore the connection of sad mood and painrelated apprehension with Low Back Torment (LBP) in Turkey. For the study, three thousand eight hundred samples were chosen at random. Responding participants were asked about their socioeconomic status, age, and other demographic information, as well as the frequency, intensity, and duration of their low back pain and the factors that were related to it. The study group consisted of those participants who had self-reported LBP during the study period. The review uncovered that 807 (37.1%) of the members detailed that they had low back torment at the hour of interview. The study participants had a score of 52.91+/ - 24.20 mm for visual simple scale, 52.30+/ - 10.67 for the Zung Despondency Scale and 24.53+/ - 17.22 for the Quebec Back Torment Inability Scale. Low back pain was found to be linked to age, female gender, smoking (more than 20 cigarettes per day), low socioeconomic status, and living in a rural area. Independent risk factors for the visual analogue scale were found to be disability (P= 0.002) and depression (P= 0.017). The study came to the conclusion that in order to prevent and treat pain, it is necessary to determine the frequency, intensity, and associated factors of low back pain. Patients with low back pain should be tested for mood disorders and self-reported restrictions on activities of daily living.

D Robertson and others, 2017. (37) inferred that mental and physical changes were significantly positively associated with low back pain, and over half of subjects reported having low back pain across grades. A few positive relationship between the cooccurrence of somatization and sorrow with different grades of low back torment were noticed. Relationship between low back torment and melancholy and somatization in a Canadian arising grown-up populace.

Studies related to health related quality of life and disability due to low back pain

A review, observational review was performed by **Gangi SD et al., 2021** (38), based on the prescriptions of 180 primary care physicians (PCPs) from 2009 to 2020. Examples of LBP prescriptions (nonsteroidal anti inflammatory drugs (NSAIDs), paracetamol, and narcotics) as well as co-meds were broke down in patients with a LBP finding. Both univariable and multivariable regression analyses looked at the characteristics of the patients and the doctors who prescribed painkillers. 10,331 patients were included, with 51.2% being female and a mean age of 51.7 years. 6449 (62.4%) received at least one pain medication, with 86% taking nonsteroidal anti-inflammatory drugs and 22% taking opioids. GP qualities (i.e., independent work status) and patient attributes (male orientation and number of counsels) were related with fundamentally higher chances of getting any aggravation prescription in multivariable examination. Co-medications were given to 3719 patients, or 36%. Muscle relaxants and proton pump inhibitors were the most frequently used co-medications. In conclusion, painkillers were used to treat two thirds of LBP patients. There was little use of strong opioids or co-medications in the prescribing patterns.

Tej DA et al., 2020 (39) investigated that Low back torment (LBP) influences 1 out of 5 youngsters without any rules for pharmacotherapy. Over one in ten children with LBP receive an opioid prescription, with significant differences based on age, gender, and location, according to their investigation of opioid prescription patterns.

Chou R et al. 2007. (40) found fair evidence that For acute low back pain, NSAIDs, skeletal muscle relaxants, and tricyclic antidepressants are effective pain relievers, according to a 2007 (40) study. Except for tricyclic antidepressants, for which the benefit was small to moderate, the magnitude of the benefit was moderate (effect size of 0.5 to 0.8, improvement of 10 to 20 points on a 100-point visual analogue pain scale, or relative risk of 1.25 to 2.00 for the proportion of patients experiencing clinically significant pain relief). Acetaminophen, opioids, tramadol, benzodiazepines, and gabapentin for radiculopathy were also found to be effective in relieving pain. There was ample evidence to support the ineffectiveness of systemic corticosteroids. Unfriendly occasions, like sedation, changed by drug, albeit solid information on serious and prolong hurts are inadequate. The majority of trials lasted less than four weeks. Barely any information address adequacy of double drug treatment contrasted and monotherapy, or gainful consequences for practical results.

Belavy DL and Others, based on seven meta-analyses, 2022 (41) concluded that opioids (35%, 40%, 25%, 20%, 61%), nonsteroidal anti-inflammatory drugs (NSAIDs) (62%, 50%, 37%, 35%, 20%), and paracetamol (21.5%) were used most frequently in primary care and the emergency department. Depending on the study and setting, muscle relaxants were prescribed at rates ranging from 0% to 53%. In addition, corticosteroids were still used to treat back pain, even though their use was typically less than 5%. In general, the data suggest that there is significant potential for cost savings and harm reduction by implementing changes in clinical practice to align medication prescription in primary care with guidelines. Depending on the dose and duration of use, patients may be exposed to potential harms, such as gastrointestinal disorders (oral NSAIDS), drowsiness or dizziness (opioids, muscle relaxants, neuropathic agents), and dependency (opioids).

Meng Q and Others, 2021 (42) Patients of all ages received oral NSAID prescriptions. Of the patients, 81.88% were endorsed NSAIDs on only one event, and 91.64% were recommended one kind of NSAID as it were. 2,360 person-times were accounted for by combining various NSAIDs. Muscular offices most normally utilized particular cyclo-oxygenase-2 (COX-2) inhibitors, while crisis divisions most ordinarily utilized conventional NSAIDs. The rates of gastrointestinal (GI) difficulties, cardiovascular (CV) ADRs, and new onset hypertension were lower in patients treated with specific COX-2 inhibitors than those treated with customary NSAIDs and NSAID blends ($P<0.05$). Patients taking imrecoxib had a lower risk of developing new-onset hypertension than those taking other kinds of selective COX-2 inhibitors ($P=0.0102$) when it came to selective COX-2 inhibitors.

Acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), topical analgesics, muscle relaxants, opioids, corticosteroids, antidepressants, and anticonvulsants are among the pharmacologic treatments for low back pain (LBP) that were reported by Hills EC in 2022 (43) Acetaminophen stays one of the most mind-blowing first-line medicines of intense LBP. It is by and large very much endured, makes not many unfavorable impacts or medication responses with different prescriptions, and is economical

The vast majority of them see ongoing narcotic treatment as a compelling procedure for relief from discomfort and utilitarian results regardless of the absence of experimental help. Despite this issue, the majority of them are aware of clinical practice guidelines but do not apply them.

AIM & OBJECTIVES

Aim: To study the prescribing pattern in patients of musculoskeletal disorders causing low back pain presenting to out -patient department of Orthopedics

Objectives:

1. To gather information regarding age, gender and socioeconomic status of patients and associate with treatment prescribed
2. To collect data regarding the etiology of low back pain (LBP) in different patients & associate with treatment prescribed
3. To categorize the patients in mild, moderate, and severe LBP and associate with treatment prescribed
4. To explore the pattern of drugs utilization according to WHO/INRUD core drug use indicators

Material & Methods

Research Question:

Is there any variation in prescribed drugs/therapies for musculoskeletal disorder (MSD) causing low back pain in different patients pertaining to severity of disease, etiology, age, gender and socioeconomic status of patients?

Hypothesis:

Null Hypothesis (H_0): There is no variation in the prescription pattern in patients of Musculoskeletal Disorders (MSDs) causing low back pain in patients differing in etiology, severity, age, gender and socioeconomic status.

Alternative Hypothesis (H_A): There are variations in prescribing pattern in patients of MSD.

Type of Study: Retrospective observational study

Place of Study : Department of Pharmacology & Department of Orthopedics

The study was carried out in patients of acute low back pain attending the Out Patient Department (OPD) of Orthopedics in Integral Institute of Medical Sciences & Research(IIMSR), 800 plus bedded , a Tertiary Care Teaching Hospital, Integral University. Prescribing patterns or drug utilization studies of drugs for LBP were elucidated based on differences in socioeconomic profile & severity of pain .

STUDY DESIGN

a. **Study Popultion**

   All registered patients of acute LBP during the study period

b. **Study Period**

   Period of study was from 1st Jan, 2023 to 31st May, 2023.

c. **Inclusion criteria**

   - Patients of acute LBP between more than 18 years of either gender having confirmed diagnosis

d. **Exclusion Criteria**

   - Pregnant & lactating women
   - History of chronic cardiac, renal, hepatic & pulmonary dysfunction

- History of recurrent psychotic disorders, alcohol or drug abuse within the previous year

e. Unit of Study

LBP patient attending Out Patient Department of Orthopedics after having taken informed consent to be included in the study .

SAMPLE SIZE

Estimation of sample size (n) is based on simple random sampling for which central information is required . Assuming 5% significance level & 80% power of the study , sample size was calculated using the following formula

$n = Z^2p(1-p)/d^2$

This formula provides us with the minimum sample size needed to detect

significant differences when z is determined by the acceptable likelihood

of error (the abscissa of the normal curve). The value of Z is generally set

to 1.96, representing a level (likelihood) of error of 5%

p is the conversion rate we expect to see (estimate of the true conversion

rate in the population), and d is the minimal absolute size difference we

wish to detect (margin of error, half of the confidence interval)

Based on this formula , sample size came out to be **100**

Methodology

1. All patients of LBP were asked to give informed consent to be enrolled in the study
2. The willing patients were given informed consent form & enrolled in the study
3. All patients of acute LBP were asked about their demographic profile (name, age, gender)
4. Socioeconomic status of patient was explored by filling KUPPUSWAMI'S MODIFIED SCALE (Table X)

5. Severity of pain of patients was discerned by filling of another form called as BRIEF PAIN INVENTORY (as Annexure)
6. 100 patients data was collected
7. At the end of study , data was compiled & analyzed statistically to know the prescribing patterns of drugs in acute LBP , any differences in treatment according to change in age, gender, severity & socioeconomic status of patients

Table X- Modified Kuppuswami Scale for calculating Socioeconomic status of patients (45)

Occupational of the head of the family:-

Sr. No.	Occupational of the head	Score
1	Legislators, Senior Officer & Managers	10
2	Professionals	9
3	Technicians & Associate professional	8
4	Clerks	7
5	Skilled workers & shop & market sales workers	6
6	Skilled Agricultural & Fishery workers	5
7	Craft and related trade workers	4
8	Plant and machine operators and Assemblers	3
9	Elementary occupation	2
10	Unemployed	1

(b) Education of the Head of the family:-

Sr. No	Education of the head	score
1	Profession or Honours	7
2	Graduate	6
3	Intermediate or diploma	5
4	High school certificate	4
5	Middle school certificate	3

6	Primary school certificate	2
7	Illiterate	1

(C) Total monthly income of the family:

Sr. no	Updated monthly family income in RS (2012)	Updated monthly family income in RS (2016)	Updated monthly family income in RS (2018)	Score
1	>30375	≥ 40, 430	>126,360	12
2	15188-30374	20,210-40,429	63,182-126,356	10
3	11362-15187	15,160-20,209	47,266-63178	6
4	7594-11361	10,110-15,159	31,591-47262	4
5	4556-7593	6060-10,109	18,953-31589	3
6	1521-4555	2021-6059	6327-18949	2
7	≤1520	≤2020	≤6323	1

Kuppuswamy's Socioeconomic Status scale 2018:

Sr. No.	Score	Socioeconomic class
1	26-29	Upper (I)
2	16-25	Upper middle (II)
3	11-15	Lower middle (III)
4	5-10	Upper lower (IV)
5	< 5	Lower (V)

Statistical Analysis

Statistical analysis was based on intent to treat (ITT) population which included all LBP patients enrolled. Study variables were summarized by descriptive statistics. Proportions were expressed as percentages . Chi square statistics was applied wherever needed.

Compliance with Good Clinical Practice and Ethics Consideration

The study was conducted in compliance with the protocol. Approval certificate was issued by Institutional Ethics committee (IEC) of the Institute

Informed consent

Patients willing to participate & eligible in the view of investigator were given the Patient information sheet in his/her vernacular language and all study related tests & procedures were explained to him/her in simple yet detailed manner. After imparting sufficient information, if the patient desired to be part of study then signature/thumb impression was taken on the consent form. The informed consent form , signed & dated by the subject (or by the subjects' legally acceptable representative) & by the person who conducted the informed consent discussion were retained by the investigator.

Amendment of Protocol

No change in the study procedure was made without the mutual agreement of principal investigator , clinical investigator & Ethics Committee

Confidentiality

The identity of patient generated in the study was bounded in strict confidence. The data is available only to the investigators involved in the study & to the regulatory authorities. Break in the confidentiality was possible only after detail review by the investigator & with permission of Ethics Committee.

Data recording & retention of study data

In compliance with the good clinical practice, the investigator was responsible for ensuring that all the study related material, case records, medical notes & other source documents were clearly marked & permitted easy identification of the subjects' participation in this trial. The results of the study may be published in the medical literature & the patient's identity will not be revealed. Ethics committee & authorized persons may wish to look at patient's records to check that the study was performed correctly.

Table no.1 Age and Gender wise Distribution of Patients

Age	Patients	Gender		Percentage
		M	F	
<30 yrs	26	11	15	26
31 – 50	50	16	36	50
51 – 70	20	08	12	20
>70	04	02	02	04
Total	100	37	63	10

The chi-square statistics is 105.9333. the p-value is< 0.0001, the result is significant at p<0.05.

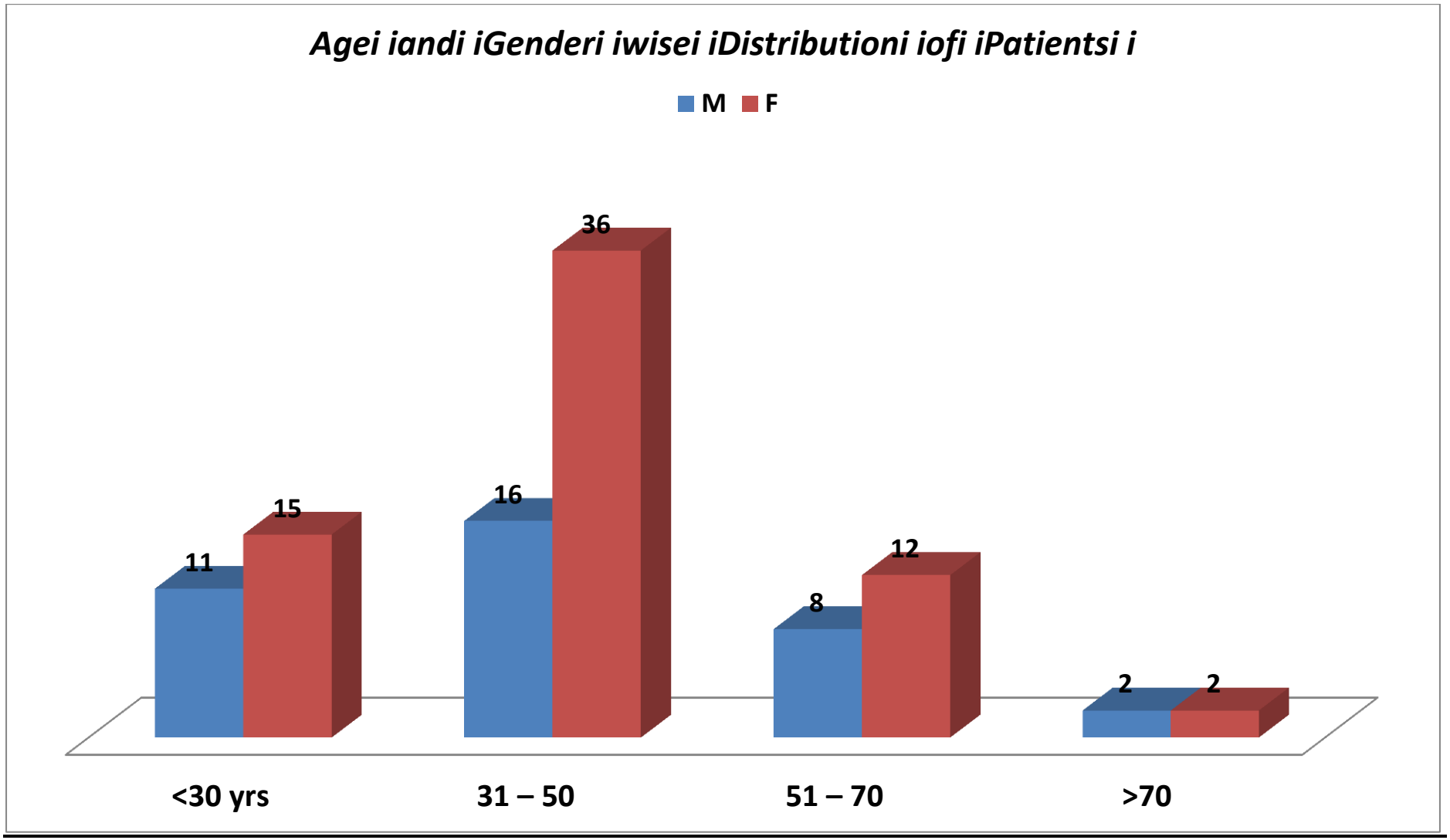
Agei iandi iGenderi iwisei iDistributioni iofi iPatientsi i
M
F
11
15
16
36
8
12
2
2
<30 yrs
31 – 50
51 – 70
>70

Table no. 2 Distribution of Patients according to Socioeconomic Status.

Age	Upper	Upper Middle	Lower Middle	Upper Lower	Lower
<30	02	11	06	11	04
31-50	-	12	13	19	04
51- 70	-	04	06	05	-
>70	-	-	-	02	01
Total	02	27	25	37	09

The chi-square statistics is 61.2215 the p value is <0.00001, the result is significant at p<0.05.

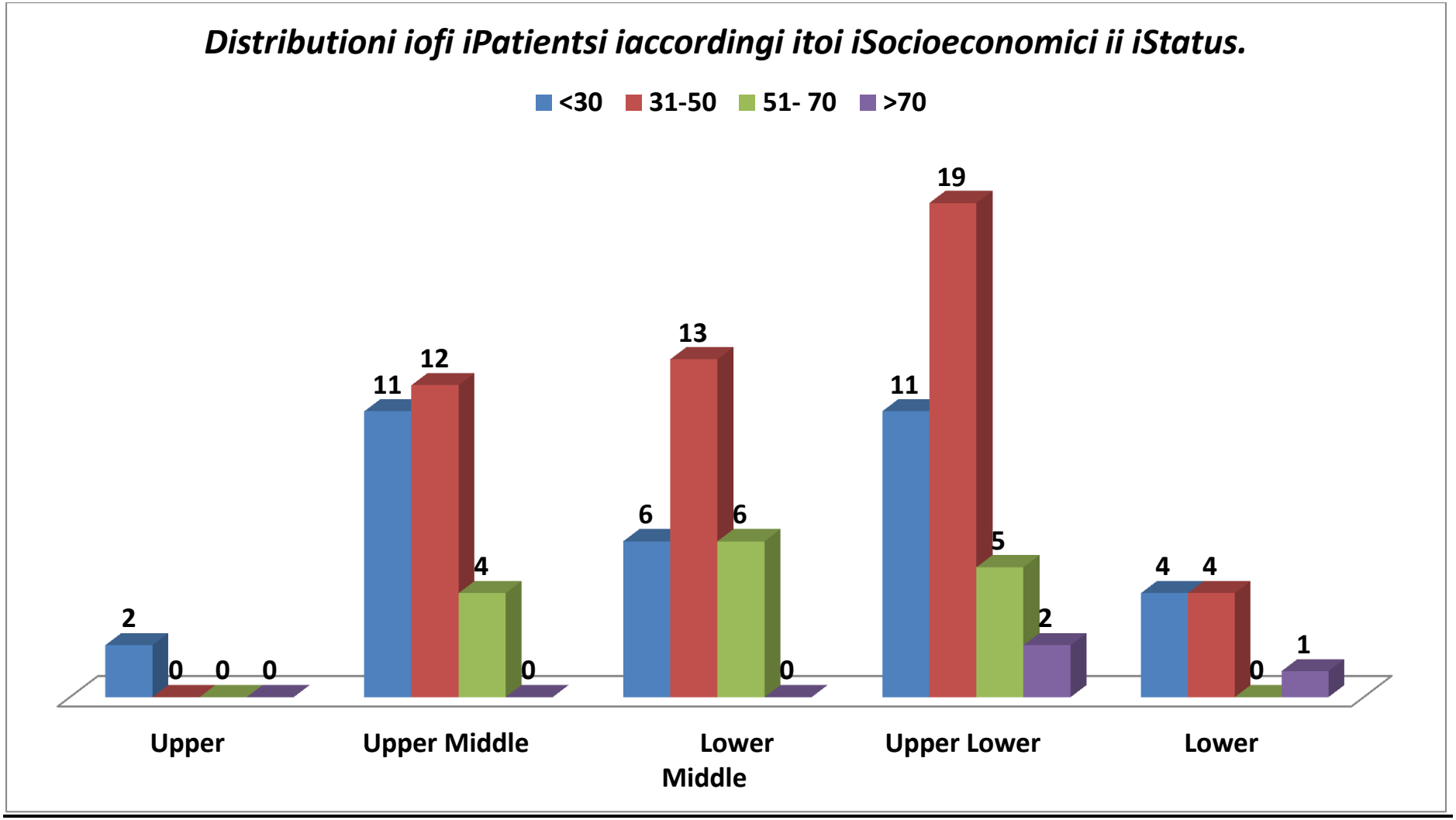
Distributioni iofi iPatientsi iaccordingi itoi iSocioeconomici ii iStatus.
<30
31-50
51- 70
>70
2
0
0
0
11
12
4
0
6
13
6
0
11
19
5
2
4
4
0
1
Upper
Upper Middle
Lower Middle
Upper Lower
Lower

Table no. 3 Distribution of Patients According to Severity of low back pain. (LBP)

Age	Mild	Moderate	Severe
<30	22	07	01
31-50	33	09	03
51-70	06	07	07
>70	01	-	03
Total	62	23	15

The chi-square statistics is 65.2236.the p-value is <0.00001, the result is significant at p<0.05.

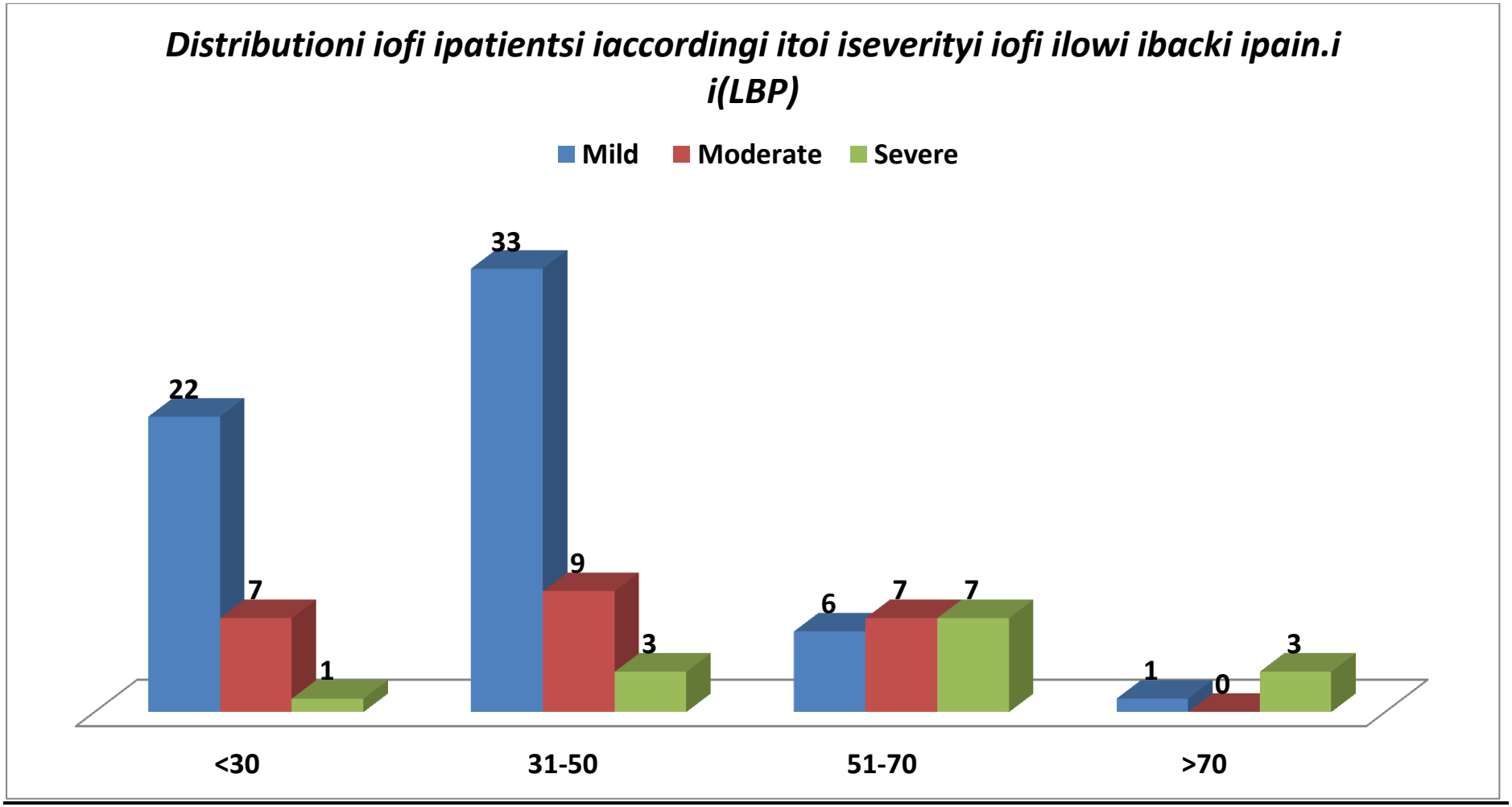
Distributioni iofi ipatientsi iaccordingi itoi iseverityi iofi ilowi ibacki ipain.i i(LBP)
Mild
Moderate
Severe
22
7
1
33
9
3
6
7
7
1
0
3
<30
31-50
51-70
>70

Table no. 4 Association Between Age Groups and Etiology

Etiology	< 30 years	31 – 50 years	51 – 70 years	> 70 years
Sciatica	04	20	05	04
Osteoarthritis	01	08	02	01
Spondylitis incd. Pott's Spine	08	12	05	02
Inflammatory low Back pain	07	06	04	01
Degenerative disc Disease	01	03	05	01

The chi square statistic is 15.2857. the p- value is 0.226185. the result is not significant at $p < 0.05$.

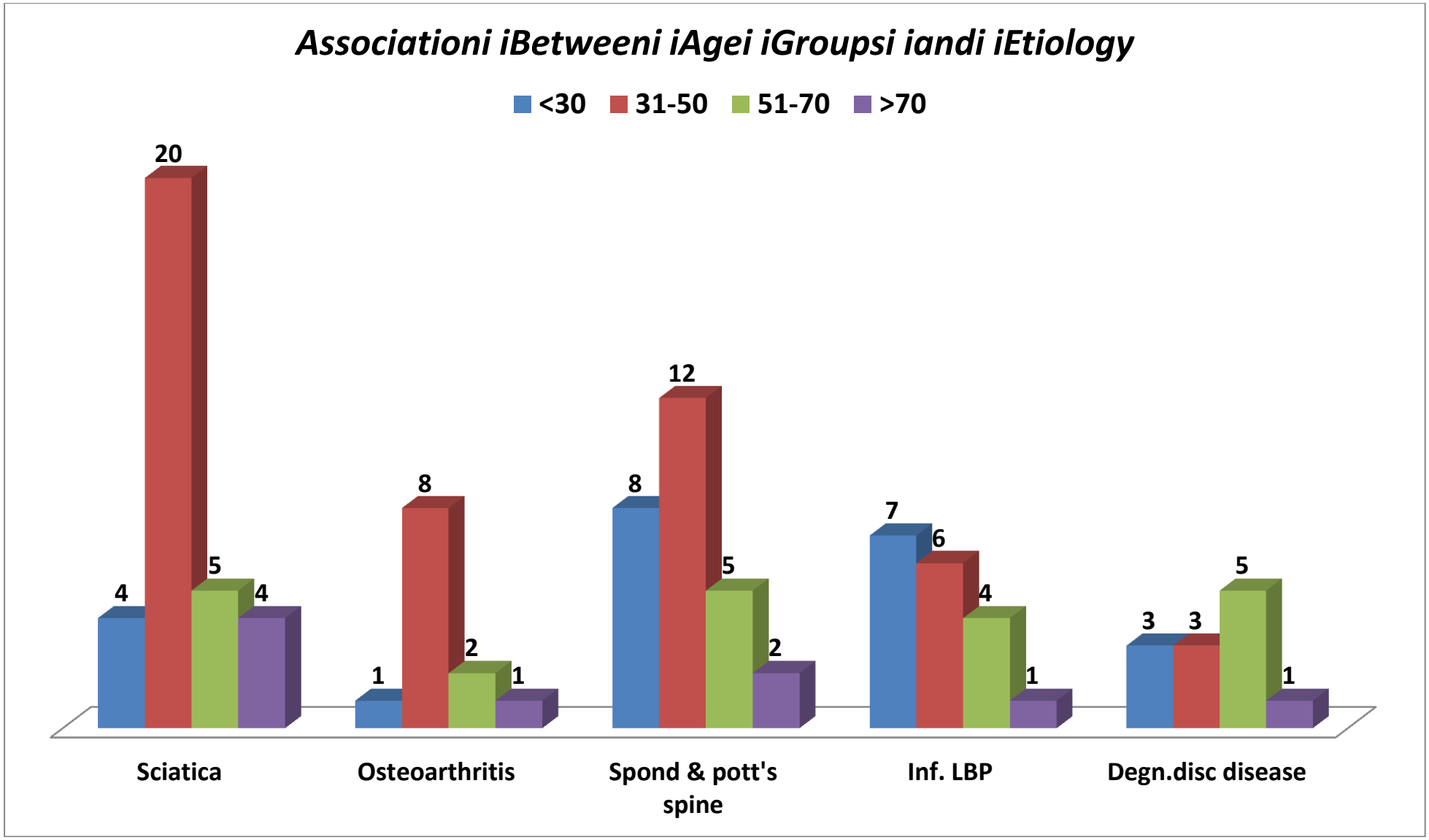
Associationi iBetweeni iAgei iGroupsi iandi iEtiology
<30
31-50
51-70
>70
20
4
5
4
1
8
2
1
8
12
5
2
7
6
4
1
3
3
5
1
Sciatica
Osteoarthritis
Spond & pott's spine
Inf. LBP
Degn.disc disease

Table no.5 Prescription Pattern According to Age of Patients.

Age groups	NSAIDs	MR	PPI / H2 Blockers	steroids	Ca++ / V.D3&M.Vitamin
<30	52	05	26	02	24
31-50	82	22	50	03	38
51-70	52	23	20	06	20
>70	44	25	04	-	12

NSAIDs- non steroidal inflammatory drugs; MR-Muscle relaxants, PPI-Proton pump inhibitor, Ca++, Vitamin D3, Multivitamin

The chi-square statistics is 152.0784. the p-value is < 0.00001, the result is significant at $p<0.05$.

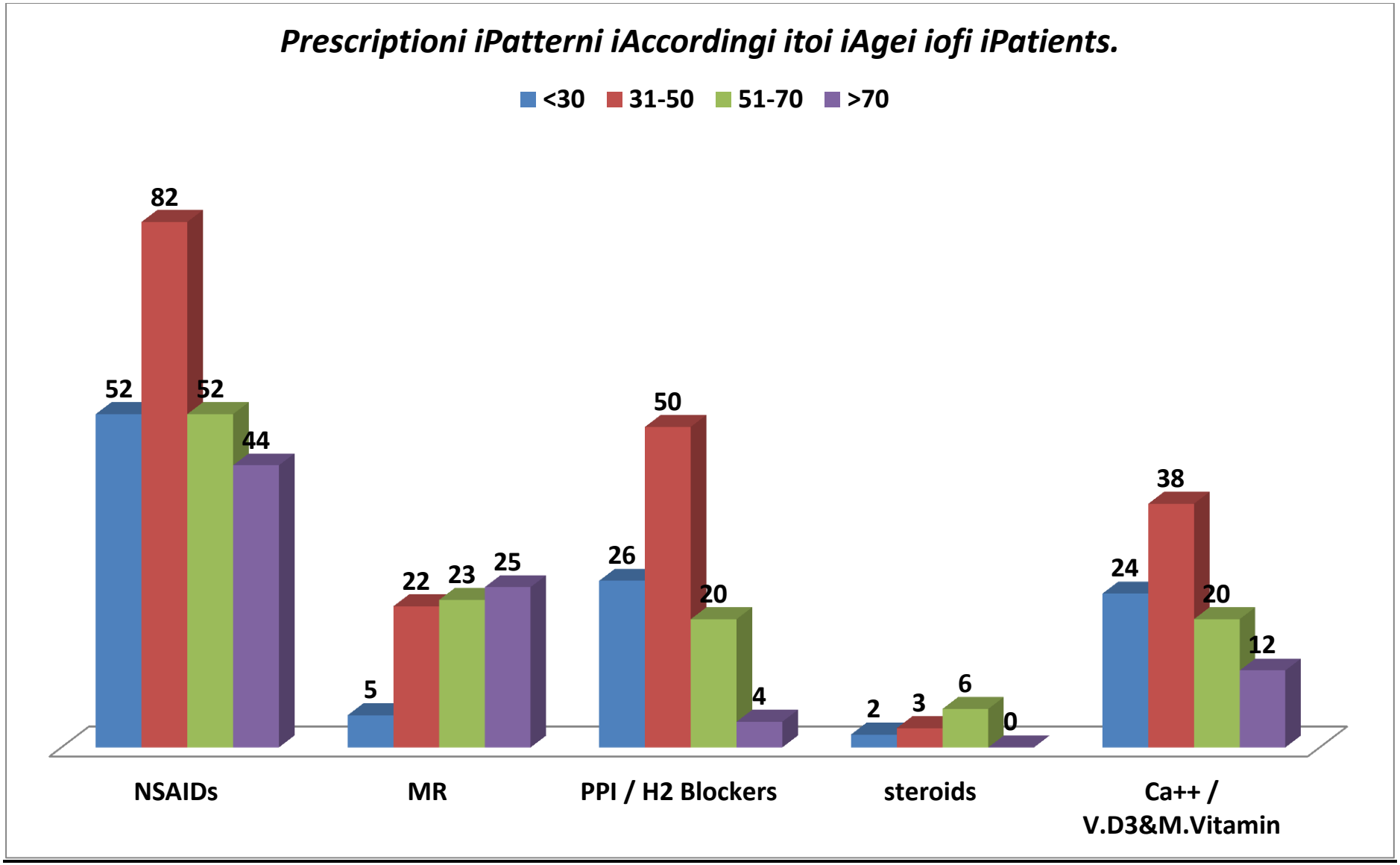

Table no. 6 Prescribing Pattern According to Severity of Patients.

Severity	NSAIDs	MR	PPI/H2 Blockers	Steroids	Ca++/V.D3&M.vitamins
Mild	63	25	63	02	15
Moderate	82	20	23	06	40
Severe	95	35	14	03	39

NSAIDs- non steroidal inflammatory drugs; MR-Muscle relaxants, PPI-Proton pump inhibitor, Ca++,Vitamin D3, Multivitamin

The chi-square statics is 13.0222. the p-value is <0.111089, the result is not significant at $p<0.05$.

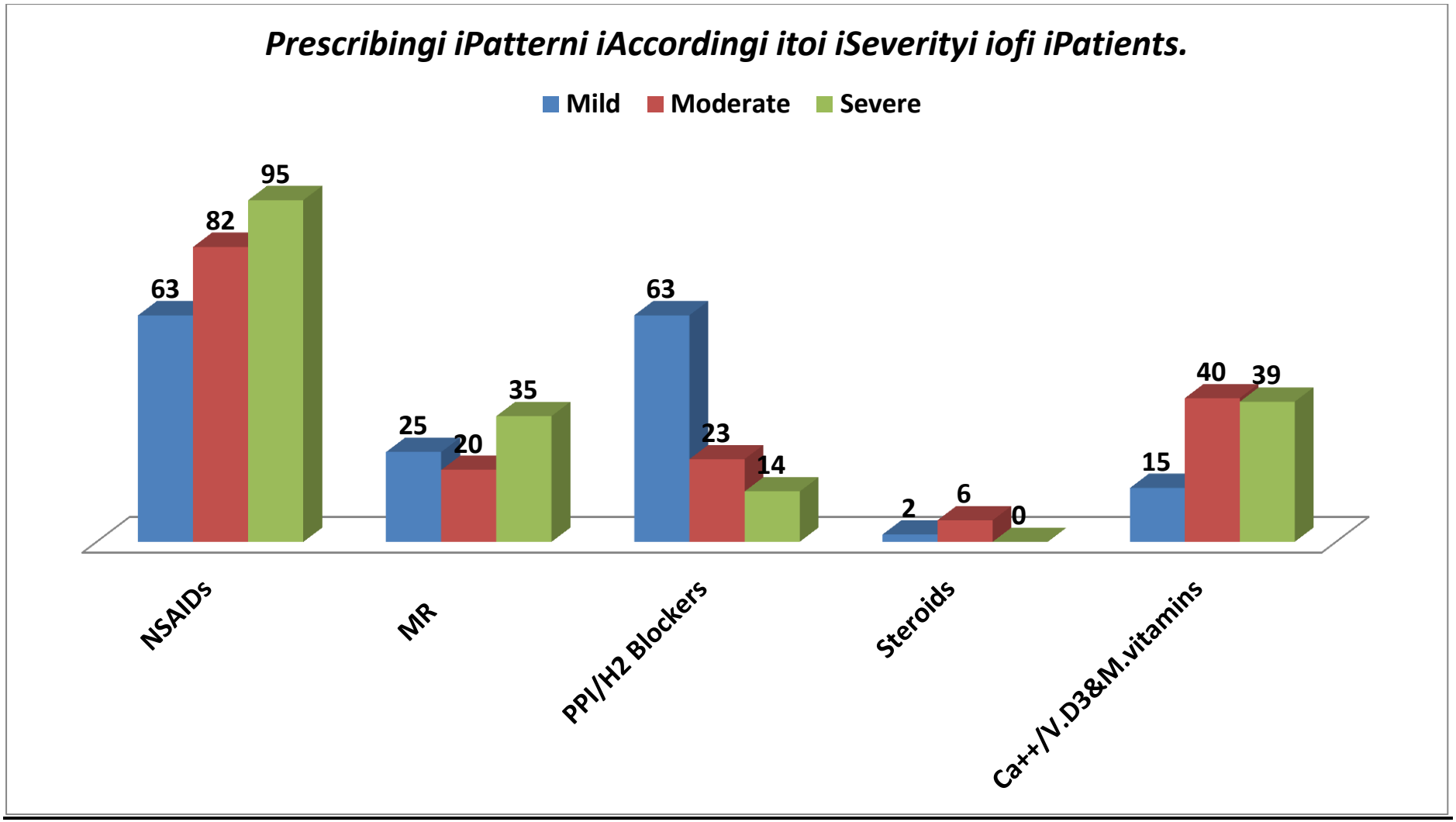

Table.7 Prescribing pattern according to socioeconomic status.

Soc-eco Status	NSAIDs	MR	PPI/H2 block	Steroids	Ca++ /V.D3&M.Vitamins
Upper	06	20	02	02	18
U.middle	77	16	28	02	19
L.middle	81	34	25	05	15
U.lower	58	06	36	02	23
Lower	19	04	09	-	19

NSAIDs- non steroidal inflammatory drugs; MR-Muscle relaxants, PPI-Proton pump inhibitor, Ca++, Vitamin D3, Multivitamin

The chi-square statics is 19.5708. the p-value is < 0.240174, the result is not significant at $p<0.05$.

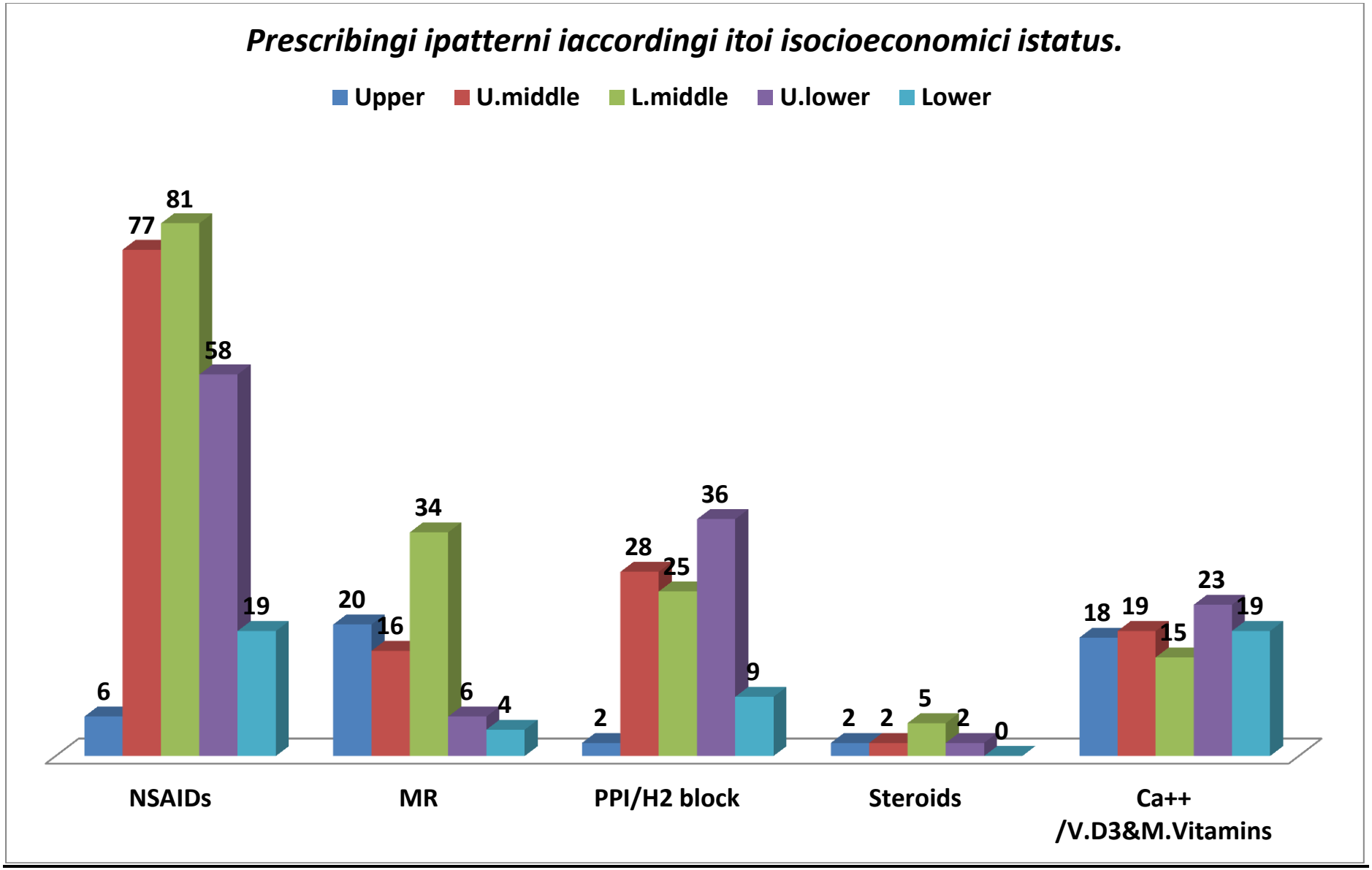
Prescribingi ipatterni iaccordingi itoi isocioeconomici istatus.
Upper
U.middle
L.middle
U.lower
Lower
6
77
81
58
19
20
16
34
6
4
2
28
25
36
9
2
2
5
2
0
18
19
15
23
19
NSAIDs
MR
PPI/H2 block
Steroids
Ca++ /V.D3&M.Vitamins

Table no. 8 Prescribing Pattern according to Etiology of Low Back Pain.(LBP).

Etiology	NSAIDs	MR	PPI/H2 block	Steroids	Ca++/V.D3&M.Vitamins
Sciatica	61	02	33	01	15
Ost.arth.	36	06	12	01	15
Spondylitis (incd.Pott's spine)	48	28	25	02	30
Degenerative Disc disease	41	18	10	04	20
Inflammatory LBP	55	06	18	03	14

NSAIDs- non steroidal inflammatory drugs; MR-Muscle relaxants, PPI-Proton pump inhibitor, Ca++, Vitamin D3, Multivitamin

The chi-square statics is 13.5537 the p-value is < 0.631924. the result is not significant at $p < 0.05$.

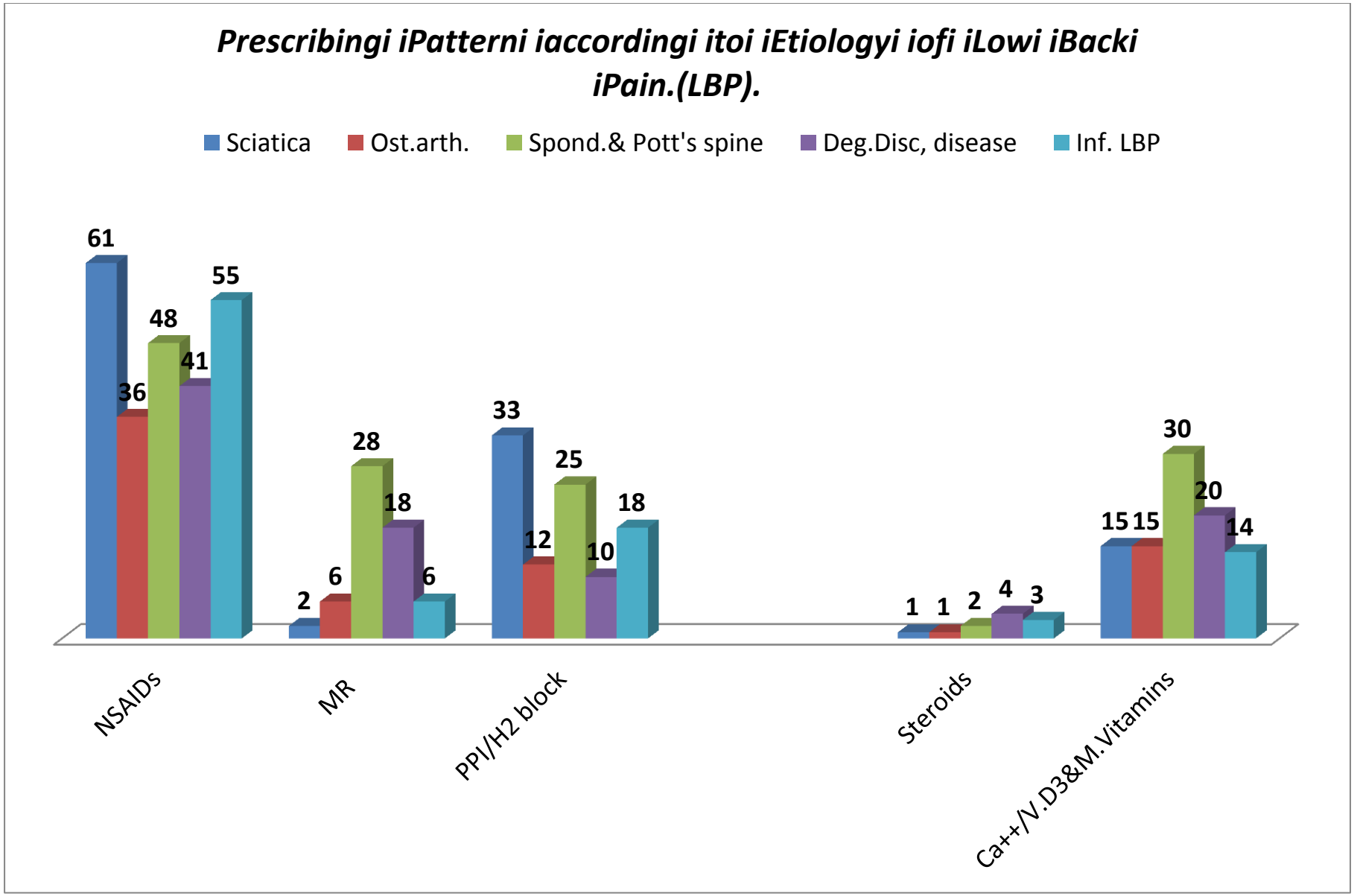
Prescribingi iPatterni iaccordingi itoi iEtiologyi iofi iLowi iBacki iPain.(LBP).
Sciatica
Ost.arth.
Spond.& Pott's spine
Deg.Disc, disease
Inf. LBP
61
36
48
41
55
2
6
28
18
6
33
12
25
10
18
1
1
2
4
3
15
15
30
20
14
NSAIDs
MR
PPI/H2 block
Steroids
Ca++/V.D3&M.Vitamins

Table no. 9 Pattern of NSAIDs used in Orthopedic (OPD).

Total number of prescriptions	=	100
Total number of drugs used	=	525
Average number of drugs per prescription	=	5.25
Total number systemic NSAIDs	=	236
Total number of systemic non -selective NSAIDs	=	187 (79.23%)
Total number systemic selective NSAIDs	=	49 (20.76%)
Total number of topical used	=	60
Total number of drugs used for reducing gastritis	=	100

Table no. 10 Comparison Selective and non-Selective NSAIDs.

NSAIDs	No. Prescriptions	Percentage
Selective		
Etoricoxib	49	100
Non Selective		
Paracetamol	71	37.96
Aceclofenac	55	29.41
Diclofenac	25	13.36

Nimesulide	05	2.67
Ibuprofen	10	5.34
Piroxicam	15	8.02
Indomethacin	06	3.2

Table no. 11 World Health Organization (WHO) Indicators for Prescription in India.

Study Data		WHO Standard
1. Average number of medicine prescribed per patients encounter.	5.25	(1.6-1.8%)
2. Percent medicine prescribed by generic name	00	(100%)
3. Percent encountered with an Antibiotic prescribed	00	(20.0-26.8%)
4. Percent encountered with an injection prescribed	00	(13.4-24.1%)
5. Percentage medicines prescribed from essential medicine list or formulary	100	(100%)

RESULTS

Gender wise Distribution of Patients (Table no.1)

Out of 100 patients, 37 patients (37%) were males and 63 patients (63%) were females both the groups had 50 patients each. Ratio between male

& female was 1:1.7.

The difference in distribution of male and female patients in the two groups was significant (P<0.05).

Distribution of Patients According to Socioeconomic Status. (Table no. 2)

Out of 100 patients, maximum patients belonged to the upper lower class 37 patients (37%). In this class, maximum no. of patients were from

age groups 31-50 years (51.35%) followed by <30 years (29.72%)followed by 51-70 years (13.51%) followed by >70 years (5.4%).

27 patients (27%) were from Upper Middle class . In this class, maximum no of patients were from age groups 31-50years (44.44%) followed

by <30 years (40.74%) , 14.81% were from age group 51-70yrs.

25 patients (25 %) belonged to Lower middle class. 52% were from age group 31-50 years , 24% each from <30% & 51-70% age group

Lower class was constituted by 9 patients (9%). Out of 9, 44.44% were each from age group <30 years & 31-50 years age group, 11.11% belonged to >70 years age group

Only 2 patients (2%) were present in upper class , they fell in age group <30 years.

Distribution of Patients according to Severity of Low Back Pain (LBP) (Table no.3)

Total 62 patients (62%) were from mild category , 23 patients (23%) from moderate & 15 patients (15%) were from severe category

In mild category, 53% belonged to age group 31-50 years, 35.48% belonged to <30 years age group; 9.67% were from 51-70 years & 1.61%

from >70 yrs age group

In moderate category, 39.13% belonged to age group 31-50yrs, 30.43% patients were from both <30yrs & 51-70 yrs. No patient was >70 yrs of

age.

In severe category, 46.66% patients were from 51-70 yrs age group, 20% belonged to both 31-50 yrs&>70 yrs age group & 6.66% patients were

from <30 yrs age group

Etiology wise Distribution of Patients (Table no. 4)

In 33% of patients , the etiology was sciatica . Out of these patients 60.60% patients were from age group 31-50yrs, 12.12% patients were each

from <30yrs &>70yrs age group. 15.15% patients belonged to 51-70yrs of age.

12% of patients suffered from osteoarthritis. Maximum no of patients (66.66%) were from age group 31-50yrs , 16.66% patients were from 51-

70 yrs age group, 8.33% patients were from each <30yrs &>70yrs.

In 27% of patients , etiology was spondylitis including Tuberculous spondylitis (Pott's Spine). 44.44% patients were from age group 31-50yrs.

29.62% patients belonged to <30yrs age group, 18.51 % patients were from 51-70yrs & 7.4% patients were from >70yrs of age

17% of patients were suffering from Inflammatory LBP. Out of these, 35.29% of patients were from each <30yrs & 31-50yrs of age group.

23.53% patients were from 51-70yrs of age group & 5.88% patients were >70yrs of age

In 11 % of patients, the cause of LBP was Degenerative disc disease.45.45% patients belonged to 51-70yrs of age, 27.27% were from age group 31-50 yrs , 18.18 % patients were <30yrs of age and 9.09% patients were >70yrs of age.

No association between age group & etiology was found. P>0.05

Prescribing Pattern according to Age of Patients (Table no.5)

Drugs prescribed in LBP patients were NSAIDs, proton pump inhibitors, H2 blockers, opioids, Muscle relaxants, steroids, Ca++, vitamin D3 (cholecalceferol) and multivitamins

All patients invariably received NSAIDs & Proton pump inhibitors(PPIs)/H2 blockers. 4 patients received opioids. 80 patients received muscle relaxant ,11 patients received steroids. 94supplementary drugs in the form of Ca++, Vit D3 & multivitamins were prescribed, <30 yrs age patients received 52 NSAIDs & 26PPIs/H2 blockers, 10 muscle relaxants. None of the patients received opioids. Two patients received steroid & 24 supplementary drugs were prescribed 31-50 yrs- Patients received 80 NSAIDs, 50 PPIs/H2Blockers.& 22 muscle relaxants ,2 patients received opioids, 03 patients got steroids & 38 supplementary drugs were prescribed 51-70yrs-Patients got 50 NSAIDs & 20PPIs/H2blockers. 23 muscle relaxants were prescribed, 02 patients received opioids while 06patients were given steroids. 20 drugs of Ca++, Vit D3 & multivitamins were prescribed >70yrs- patients received 44 NSAIDs & 04 PPIs/H2 blockers, 25 muscle relaxants were prescribed, 12 supplementary drugs prescribed. No opioids & steroids were given

Prescribing Pattern according to Severity of Patients (Table no. 6)

Each category of patients received same drugs. No statistically significant difference ($p>0.05$)was observed in all categories regarding treatment.

All category patients were given NSAIDs & PPIs/H2 blockers. Mild category did not receive opioids while steroids were given to 02, 03, 06 patients of mild , moderate & severe category respectively.80 muscle relaxants & 15 supplementary drugs (Ca++, Vit D3 & multivitamins) in mild category, 40 in moderate category & 39 in severe category patients were prescribed

Prescribing patterns according to Socioeconomic status (Table no. 7)

All patients were divided into 5 classes of socioeconomic status according to Modified Kuppuswami's Scale viz Upper class, Upper Middle,

Lower Middle, Upper Lower & Lower.

All patients of all classes received invariably NSAIDs, PPIs/H2 Blockers & muscle relaxants. One patient of each class received opioid except

for lower class. Steroids were prescribed to two patients in upper, Upper middle & upper lower class & 5 patients to lower middle class while no

patient of lower class received steroid. Supplementary drugs were given to all patients .

There was no significant association between socioeconomic status of patient & prescribing pattern in LBP patients ($p>0.05$)

Prescribing Pattern according to Etiology of LBP(Table no. 8)

There was no significant association between the etiology of LBP & drugs used for the treatment ($p>0.05$).100% patients including patients of

Sciatica, Osteoarthritis, Spondylitis , Degenerative disc disease & Inflammatory LBP received NSAIDs, muscle relaxants& anti gastritis drugs.

Few patients received opioids & steroids. Ca++, vitamin D3 & multivitamins were prescribed sufficiently

Pattern of NSAIDs used in Orthopaedic OPD (Table 9 & 10)

Total no of prescriptions were 100. Total no of drugs used were 525. Average no of drugs per prescription was 5.25. total 236 systemic NSAIDs

were prescribed. Out of these, 187 (79.23%) were non selective & 49 (20.76%) were selective NSAIDs. Topical preparations used were 60.

Number of drugs used for reducing gastritis were 100

WHO Indicators for Prescription (Table 11)

WHO drug Prescription indicators are.

1. Average number of medicine prescribed per patient encounter.
2. Percent medicine prescribed by generic name.
3. Percent encounter with an antibiotic prescribed.

4. Percent encounter with an injection prescribed.
5. Percent medicine prescribed from essential medicine list or formulary.

Average number of medicines prescribed per patient encounter was 5.25. medicines prescribed by generic name was 10. No antibiotics & injections were given. 100% drugs were from Essential Medicine List.

Discussion

LBP is one of the common causes of activity restrictions and absence from work place globally (46, 47). Initially, LBP wasconsidered to be a threat of developed countries but now various studies have explored the high prevalence in developing countries too.(48,49). Prescription pattern studies are important for clinical, socioeconomic & knowledge purposes. These studies not only provide feedback to the prescriber but also creates awareness regarding rational use of medicines.(50)

Our study focused on demographic profile & prescribing patterns in LBP in a tertiary care teaching Hospital in Northern India. Kopec JA et al., 2004 (51)&Alam N et al., 2012 (52) concluded that prevalence is highest in 3rd decade of life in their study . Our study also explored the same. Maximum no. of patients belonged to 31-50 years of age group. Sex predilection is towards female. Male , female ratio is 1:1.7. that is statistically significant.($p<0.05$). Studies conducted by Linton et al., 1998 (53)Thomas et al., 1999 (54) and Hoy et al., 2010 (55) also demonstrated higher incidence in females while Ganesan S et al., 2017 (56) reported higher prevalence in males (54.7%) as compared to females (45.3%).

In the present study, maximum no of patients belonged (37%) to upper lower class, 27% to upper middle class, 25% lower middle, 09% to lower class & 02% to upper class according to Modified Kuppuswami's Scale of socioeconomic scale. Study conducted by Ganesan Set al., 2017 (56) concluded that maximum no. of patients belonged to upper middle (75.8%) followed by lower middle class (13.8%) , 9.7% patients belonged to upper class, 0.7% to upper lower class. In our study, 62% patients belonged to mild category, 23% to moderate & 15% to severe category according to Brief Pain Inventor while study conducted by Ghanei I et al., 2014 (57) reported almost same number of patients in mild (45.1%) & moderate (44.9%) category & 9.7% from severe category.

In present study,5 major etiologies of LBP were explored. These were Sciatica, Osteoarthritis, Spondylitis including Pott's Spine, Inflammatory LBP & Degenerative Disc Disease . While comparing the etiology with the age groups of patients no significant association was found (P>0.05) concluding that any etiology is not consistent to any specific age group. We could not find any other study comparing the etiology of LBP with the age group.

Irrational prescribing practices prevail globally & ultimately lead to hazardous health outcomes. Rational prescribing includes that patient should receive right drug, in right dose, by right route , for right duration and right documentation (58). WHO/INRUD (International Network of Rational Use of Drugs) core drug use indicators in 1990s, discovered a set of indicators to know the pattern of drugs utilization by health care facilities (58).

The irrationality exists in the form of polypharmacy , use of unnecessary expensive drugs, overuse of antibiotics & injections, behavior of prescriber.

Average no of patients per encounter was 5.25 in our study while it was 3.83 in a study (59), 2.5(60) & 5.3 (61) in other studies which is much higher than WHO indicators (standard 1.6-1.8) indicatingpolypharmacy i.e. irrational prescribing . This is a usual practice that is often seen but number of drug should be minimum in number to avoid drug- drug interactions & adverse drug reactions. Use of antibiotics &injectables were none in our study.Other studies reported use of antibiotics in 19.6% & very few injectables (61). All the drugs prescribed were from essential drug list /formulary , this is in accordance with Wendie et al.,2021, (62) who reported 100% prescribing by essential drugs list too, while it was 84% by Nagla A et al., 2016.(61) No drug was prescribed by generic name in our study, similar to our findings, authors of a study (61) reported just 2% prescribing by generic name , on contrary, various studies are there where drugs were prescribed by generic name even upto 98% (62).

Prescribing drugs by generic name is an indicator of quality of prescription. It curbs the cost of per prescription & can determine the compliance level of health care facility.

The drugs prescribed were NSAIDs, opioids, muscle relaxants, Proton pump inhibitors/H2 blockers, corticosteroids, Calcium salts, Vitamin D3 & multivitamins. Hot packs & exercise were also advised to different patients. No association was found between age groups & prescribed drugs, between socioeconomic status & drugs prescribed, between etiology & drug treatment and also no association between severity of pain & prescribed drugs.($p>0.05$).

We could not find any other study which explored the above mentioned associations regarding LBP treatment.

Regarding pattern of NSAIDs used in LBP, total used systemic NSAIDs was 236. (44.95%) , while it was 39.6% by a study (61). Out of these, 187 drugs (79.23%) were non-selective &49 (20.76%) were selective (COX-2 selective) NSAIDs. Study by Sharma T et al., 2006 (63) showed 56.3% non- selective & 43.6% selective NSAIDs. Use of selective NSAIDs has declined probably because of their cardiovascular adverse drug reactions. 60 (11.42%) topical NSAIDs were prescribed like diclofenac, methyl salicylate & fentanyl. Among non-selective ,paracetamol constituted highest number i.e. 37.96% followed by aceclofenac (29.41%), diclofenac(13.36%). Among others were, ibuprofen(5.34%), piroxicam (8.02%), nimesulide (2.67%) & indomethacin (3.2%). Study by Motagahre VM et al., 2016 (59) , concluded ibuprofen (55.58%) to be most commonly used NSAID while other study (52) reported aceclofenac&diclofenac to be most frequently used drugs (5.26 % & 40.66% respectively). The study also showed more use of non-selective than selective indicating the increasing concern towards cardiovascular toxicity of selective COX-2 inhibitors . In our study , the only COX-2 selective drug used was etoricoxib (100%) considered to be

relatively safer than valdecoxib . Along with analgesics, thiocolchicoside , a muscle relaxant was prescribed to a fair number of patients (15.23%)

Other drugs like proton pump inhibitors constituted 19.04% of total drugs used. Nagla et al., 2016 (61) also concluded the same i.e. 20.2%. Multivitamin, Calcium salts & vitamin D3 constituted 17.90 % while these were only 5.3% in Nagla et al., 2016(61). 2.09% corticosteroids were prescribed.Another study (41) also reported less than 5% of corticosteroid use.

Limitations of the study –single center study, small sample size& cost per prescription can not be discerned

Conclusion

A very common practice of polypharmacy was seen in many prescriptions. Total number of drugs were 525. Number of drugs per prescription was 5.25 higher than WHO/INRUD indicators (1.6-1.8). Analgesics , muscle relaxants, gastric acid reducing agents, corticosteroids , Calcium, multivitamin & vitamin D3 were commonly used drugs. Among NSAIDs , (44.95% of total drugs used) non-selective NSAIDs constituted 79.23% & selective ones was 20.76%. opioids formed 0.76% of total drugs used. Muscle relaxants &corticosteroids constituted 1.5% &2.09% respectively. Calcium , multivitamin & vitamin D3 formed 17.90% of total drugs used. Drugs prescribed by generic name was nil while it should be 100% according to WHO indicators. Percentage of encounters with antibiotics &injectables were also nil (WHO standards – antibiotics 20-27%, injectables 13.4-24%)). 100% drugs were prescribed from National List of Essential Medicines (NLEM) which complied with WHO standards. Cost per prescription can not be discerned.

Maximum number of patients belonged to 31-50 years of age-group. Females & males ratio having Low Back Pain (LBP) was 1.7:1 , which was significant. No association was found between age of the patient & prescribed drugs, socioeconomic status of patients & prescribed drugs, severity of LBP & prescribed drugs and etiology of LBP & drug treatment.

Thus, we can conclude that irrational prescribing exists all around. To minimize this, regular CMEs, workshops, lectures, OPD/ward visits on rational prescribing should be held by competent authorities without hurting anyone’s ego.