

Comparative Assessment of Musculoskeletal Injuries (Including Sports Injuries) in a Global Transcontinental Population Treated in an Orthopedic Physiotherapy Centre of UN Level II Hospital in a UN Peace Keeping Mission

Pallavi Verma

AIIMS: All India Institute of Medical Sciences-Rishikesh

Shivendra Kumar Sinha (✉ sksinhaafmc67@gmail.com)

AIIMS: All India Institute of Medical Sciences-Rishikesh <https://orcid.org/0000-0002-3709-4149>

Research

Keywords: Transcontinental, Peacekeeping, Lebanon, UNIFIL, Musculoskeletal injuries

Posted Date: June 30th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-659156/v1>

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Abstract

BACKGROUND:

Musculoskeletal pain is one of the leading causes of years lived with disability, which constitutes a substantial burden on society. This study was done in a global transcontinental population dependent on a single physiotherapy centre of a UN level II Hospital in Naquora, Lebanon (catering predominantly to the military population of >39 countries serving in UNIFIL Lebanon) between Jan 2014 to Dec 2019. The patients were of various musculoskeletal injuries (including sports injuries- both acute and chronic) requiring conservative treatment, predominantly physiotherapy – using physiotherapy-based equipments followed by different rehabilitation exercises. Literature lacks any study involving the predominantly adult military population cohort of various parts of the globe with similar lifestyles and duties treated in a single centre.

METHODS:

Patients from more than 39 countries spread across various continents are included in this study. It is a retrospective observational study comprising hospital-based cohorts of patients who did not need any operative intervention for the treatment and were essentially managed conservatively using physiotherapy equipments and rehabilitation exercises on OPD/inhospital admission basis. They underwent necessary diagnostic tests and then multiple sittings of physiotherapy as part of the individual treatment protocol. Data was collected from the UNIFIL Hospital registers. SWD, IFT, TENS and other physiotherapy equipments and rehabilitation aids were used in the treatment.

RESULTS:

The study shows back complaints more common in all populations and more disabling than other injuries each year throughout the study. Foot and ankle complaints were the least reported symptoms in the centre. Regionwise, the local population was the largest clientele followed by Asians & thereafter equally by the found in the March to September months because of more outdoor sports activities during these months due to the congenial weather conditions.

CONCLUSION:

Back complaints are the most common complaints compared to the peripheral limbs and extremities complaints. All continents are equally affected irrespective of their original race, culture and climate. Dedicated hospital staff and good physiotherapy equipments are essential to treat such patients. Timely consultation to specialist doctors help to mitigate such ailments early by conservative means. SWD and IFT effectively treats both acute and chronic musculoskeletal complaints than single isolated SWD or IFT therapy.

TRIAL REGISTRATION:

Since this study is a retrospective observational non-interventional study not involving any new drug/implant /equipment. Hence, trial registration is not applicable in this study. The study is purely of academic and research interest and the security classification of this research study is unclassified category.

Background:

Recently, the Global Burden of Disease studies mentioned musculoskeletal pain as one of the leading causes of years lived with disability, which constitutes a substantial burden on society (1, 2). Nearly 1.71 billion people have musculoskeletal conditions globally. Among all musculoskeletal disorders, low back pain is causing the highest load, with a prevalence of around 568 million people. Musculoskeletal conditions are the main reasons of disability worldwide, with low back pain being the single leading cause of disability in 160 countries (3). Therefore, it is crucial to design better prevention strategies and effective early treatment. To do that, more basic knowledge about the epidemiology of musculoskeletal complaints must be obtained first (2).

This study has been done to estimate the incidence and prevalence of musculoskeletal injuries (including sports injuries- both acute and chronic) requiring physiotherapy in a global transcontinental population scenario in a United Nations peacekeeping mission level II Hospital UNIFIL in Naquora in Lebanon from Jan 2014 to Dec 2019. Patients from > 39 countries spread across various continents are included in this study. The security classification of this study is unclassified and can be considered purely for academic and research interests. Literature still lacks any study involving the predominantly adult military (army > navy) population cohort of various parts of the globe in a single centre with similar lifestyles and duties. Literature data are lacking from the African nations, South America, Eastern Europe, Australia & Asia. Better understanding the unmet burden of musculoskeletal conditions in Low-to -middle-Income countries (LMICs) is crucial in effectively distributing resources and supporting the underserved populations. To address the existing gaps and heterogeneity in the literature, further research should include population-based sampling with larger geographic representation in LMICs to find the burden of the disease more accurately (4).

Methods:

The study predominantly included the young military patients and the local Lebanese military and civilian patients, and some UN International civilians. All these were entitled patients working for the UNIFIL as part of the umbrella organization – United Nations organization (UNO).

All the patients were generally doing routine daily activities before their respective injuries happened, requiring them to visit the UNIFIL Level II hospital primarily or through referrals. It is a retrospective observational study comprising hospital-based cohorts of patients who did not need any operative intervention for the treatment. The patients were essentially managed conservatively using physiotherapy equipments and rehabilitation exercises before they were declared fit to resume their military/ civil duties.

They were managed while being admitted to the UNIFIL Hospital or on OPD basis depending on the requirement of the patients. For this, they need to undergo multiple sittings of physiotherapy as part of the treatment protocol and some routine analgesics SOS. Clinical tests, diagnostic lab tests, digital X-rays, musculoskeletal ultrasound (facilities available in the hospital) were routinely done to arrive at a diagnosis and rule out any elements of malingering. The UNIFIL hospital comprised of multinational team of doctors and paramedics- Indian orthopedic surgeon (First author) with physiotherapist and lab technician, internist, surgeon, and otolaryngologist; Italian and Indonesian radiologist; Belarusian surgeon- all uniformed personal and part of their respective army contingent and experienced in their respective medical field. The referrals used to come centrally through their country's regimental medical officers managing their separate infirmaries in their battalion location spread in a general area. The advantages/ disadvantages of Workman's Compensation were always kept in mind. However, no patient was neglected, and the benefit of the doubt was always given to the patient during the treatment. The data was collected from the UNIFIL hospital registers mentioning the personal & demographic details of the patients along with the treatment details.

The study was done by a single Indian Military orthopedic surgeon using equipments in a single orthopedic physiotherapy centre of UNIFIL Level II Hospital. All statistical work was done by the corresponding author having sound professional knowledge of the international standard. All physiotherapy equipments of the centre were of leading global manufacturing companies procured by the parent organization UNO and in good working condition predominantly being used were Short Wave Diathermy (SWD), Interferential Therapy (IFT), Transelectrical Nerve Stimulation (TENS), and other physiotherapy rehabilitation aids.

The study was done comparing various aspects of the musculoskeletal complaints- the predominant parts involved in the injury, the continents of the patients they belonged to, the monthly treatment load of the physiotherapy department, and the monthly physiotherapy sittings required to treat such musculoskeletal injuries. The upper limbs constituted the shoulder, elbows, wrists, and finger complaints (of all orthopedic and rheumatology types), neck constituted the cervical spine and its associated radiculopathy complaints to the upper limbs, lower limbs included the hip and the knees and complaints restrictive to above the ankle region (excluding the foot & ankle), back constituted the dorsal (thoracic) and lumbosacral spine and its associated radiculopathy complaints. In contrast, the foot& ankle included the region below the ankle joints (including the ankle joints) to the toes. The physiotherapy centre was managed under the guidance of the orthopedic surgeon.

Results:

The enormous challenge of this study was the heterogeneity of outcomes. The pooling of results to obtain combined reliable estimates of the prevalence and incidence was impossible to conduct. Table 1 and the corresponding graph 1 showed that back complaints were predominantly being consistently the most common musculoskeletal complaints each year throughout the study irrespective of the year, while the foot and ankle region being the least reported there, possibly because back complaints being the

most noticeable making the individual bedridden and more burdensome to the organization while the foot & ankle being the least reported there as it being a peripheral regional part of the body, relatively appearing to be less disabling to the individual and most of them could have been managed in the respective infirmary with rest & analgesics only.

Table 1
ANNUAL REGIONAL BODY PART DISTRIBUTION IN THE STUDY

YEAR	NECK	UPPER LIMBS	LOWER LIMBS (EXCL FOOT & ANKLE)	BACK	FOOT & ANKLE	TOTAL
2014	47	35	14	92	2	190
2015	64	49	42	154	13	322
2016	61	46	58	97	19	281
2017	92	141	122	171	21	547
2018	79	109	106	192	48	534
2019	121	115	108	210	66	620

Table 2 and the corresponding graph 2 showed middle east consistently had the most significant number of patients throughout the study, probably the reason being the local Lebanese army & civilian population constituted the largest clientele of the hospital followed by the Asians and then almost equally by the Europeans & Africans especially in the later years of the study.

Table 2
CONTINENT WISE (NO. OF PATIENTS) LOAD OF PHYSIOTHERAPY DEPT

YEAR	ASIANS	AFRICANS	EUROPEANS	MIDDLE EAST	AMERICANS	TOTAL
2014	28	6	49	105	2	190
2015	60	17	72	172	1	322
2016	69	28	45	134	5	281
2017	151	63	97	221	15	547
2018	137	102	121	160	14	534
2019	151	106	113	222	28	620

Table 3 & the corresponding graph 3 showed most of the musculoskeletal complaints are in the middle part of the year (March to September months) compared to the initial or end of the year, probably because of more outdoor activities during these months compared to the other months when due to uncongenial climate variations, such outdoor activities are not encouraged. Table 4 and the

corresponding graph 4 substantiate the inference of Table/graph3 as the load of the patients requiring multiple physiotherapy sitting increases during these months(March to September) compared to the other parts of the year.

Table 3
MONTHLY LOAD OF PATIENTS IN PHYSIOTHERAPY DEPT
FROM 2014 TO 2019

MONTH	2014	2015	2016	2017	2018	2019
JAN	20	22	23	32	34	45
FEB	15	20	27	35	41	51
MAR	12	26	19	22	13	51
APR	12	30	19	25	55	50
MAY	19	31	30	38	43	61
JUN	19	28	20	73	42	56
JUL	13	33	25	51	89	49
AUG	17	26	16	67	58	59
SEP	13	21	34	54	57	45
OCT	16	20	19	54	41	58
NOV	15	29	27	62	41	59
DEC	19	36	22	34	20	36
TOTAL	190	322	281	547	534	620

Table 4
MONTHLY DATA OF PHYSIOTHERAPY SITTINGS FROM 2014
TO 2019

MONTH	2014	2015	2016	2017	2018	2019
JAN	140	140	155	197	236	276
FEB	131	131	127	152	296	275
MAR	37	174	114	107	48	218
APR	66	185	114	131	365	210
MAY	54	211	254	113	323	361
JUN	95	214	144	274	150	253
JUL	99	230	230	312	656	358
AUG	102	257	138	410	480	241
SEP	98	195	286	340	356	360
OCT	161	110	122	301	265	270
NOV	126	148	115	62	342	345
DEC	138	198	117	252	94	102
TOTAL	1247	2193	1916	2652	3611	3269

Table 5 shows the list of troops contributing countries continent-wise dependent on the UNIFIL Hospital for their treatment. Apart from these countries, U.N. International civilian employees from all across the globe working in the UNIFIL were part of this study, including some North and South Americans.

Table 5
LIST OF TROOPS CONTRIBUTING COUNTRIES (INCL CIVILIANS) IN UNIFIL

SR NO	ASIA	AFRICA	EUROPE	MIDDLE EAST	AMERICA
1.	INDIA	GHANA	ITALY	LEBANON	BRAZIL
2.	CHINA	TANZANIA	FRANCE	CYPRUS	GUATEMALA
3.	INDONESIA	SIERRA LEONE	SPAIN	TURKEY	EL SALVADOR
4.	MALAYSIA	NIGERIA	AUSTRIA	GREECE	
5.	NEPAL	KENYA	BELGIUM	QATAR	
6.	SOUTH KOREA		IRELAND		
7.	SRI LANKA		FINLAND		
8.	BANGLADESH		BELARUS		
9.	CAMBODIA		SERBIA		
10.	BRUNEI		SLOVENIA		
11.			CROATIA		
12.			HUNGARY		
13.			ARMENIA		
14.			GERMANY		

Discussion:

Overall, the above study shows similar trends in all five years suggestive of the nature of the problem independent of the orthopedic surgeon doing the treatment. Back complaints are the most sought-after musculoskeletal complaints throughout each year of the study. Ankle & foot injuries though very common injuries (7), but the reporting rate is less in this study. More patients require physiotherapy in the summer months (March to September) due to more outdoor activities, including sports activities. In cold winter months, primarily elderly with chronic injuries and low backache aggravated conditions formed the bulk of the physiotherapy load.

The back problem affected more common than other body parts- both in the working and the elderly population (5, 6). Among the upper and lower extremities, lower extremities (combining the lower limb (excluding foot & ankle) and the foot & ankle data) showed a lower extremity complaint ratio from 1: 1.1 to 10.3 (mean ratio 1:5.1 in young children vs. 1: 2.5 in elder children) (7, 9).

Apart from the local Lebanese population, Asians & Europeans were found to be both injury-prone. African cohorts are less prone to injuries/ less involved in sports injuries, depending on the prevalent type

of sports one is involved in. However, interestingly, it is to be noted that the threshold of reporting pain is also strongly culturally dependent, and hence caution must also be exercised in extrapolating these results. WHO data 2021 from Global Burden of disease also mention that High-Income countries are the most affected by a large number of people - around 441 million, followed by countries in the WHO Western Pacific Region with about 427 million and South-East Asia Region with 369 million. The World Health Organization (WHO) mentioned recently by "Rehabilitation 2030: A Call for Action" (February 6–7, 2017, Geneva, Switzerland) and the publication of key recommendations for action (11). The ambitious United Nations Sustainable Development Agenda and upcoming Decade of Healthy Aging 2020–2030 provide a renewed chance for global and national action to reduce global disability through appropriate action on musculoskeletal pain (10).

SWD + IFT in combination therapy during the physiotherapy sittings was more effective in treating both acute and chronic conditions than single isolated SWD or IFT therapy in terms of pain relief and early return to normal activities (12).

Limitations:

The limitation of this study was that it was mainly on the adult and a predominantly military-based cohort of patients (considered relatively fit and free of major comorbid diseases) and did not include the young children and the elderly population, which constitute a significant dependent population to the health care centres of the society. It is strictly an epidemiological study focusing on only a few parameters- viz. the body region involved, time (months) of maximum incidence, and the geographical distribution of the patients they belonged to. However, the inferences cannot be extrapolated universally as more studies on a similar cohort of patients are needed to arrive at a definitive conclusion. The sample size of patients included in this study was also a limiting factor. Detailed Statistical analysis also could not be performed of these data as it involved mainly the data collected from the single physiotherapy centre and did not have access to the extensive data of all the patients visiting the hospital or patients who were managed at the infirmary level, etc.

Conclusion:

Musculoskeletal complaints comprise a large part of hospital visits in the younger military population cohort of patients. Axial body (Back) complaints are the most common compared to the peripheral limbs and extremities complaints. All continents are equally affected irrespective of the race, culture, climate they belong to originally. The hospitals managing such patients should be adequately staffed with a well-qualified physiotherapist with good physiotherapy equipments with both timely replaceable expendable spare parts to cater for the wear & tear of the heating pads of these physiotherapy equipments. Timely reporting for a consultation to the specialist doctors should always be encouraged before such musculoskeletal complaints become chronic and resistant to the physiotherapy and conservative means of treatment modality. SWD + IFT effectively treated both acute and chronic musculoskeletal complaints than the single isolated SWD or IFT therapy.

Abbreviations:

SWD- Short wave diathermy; IFT- Interferential therapy; TENS- Transelectrical Nerve Stimulation; UN /UNO – United Nations Organisation; UNIFIL- United Nations Interim Force In Lebanon.

Declarations:

- 1. Ethics Approval:** This study was a retrospective observational study. Hence Ethics committee approval is not applicable.
- 2. Consent for Publication:** Both the authors give consent to the journal for publication.
- 3. Availability of data & materials:** All data is available with the corresponding author.
- 4. Competing Interests:** The authors declare that they have no competing interests. There is no potential source of conflict of interest.
- 5. Funding:** There is no source of funding in this study.
- 6. Authors Contribution:** SKS conceptualized and collected the data. PV designed and gave the final draft to the manuscript.
- 7. Acknowledgement:** I acknowledge the untiring efforts of the physiotherapists and the entire hospital staff who helped me in collection of the data.

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Figures

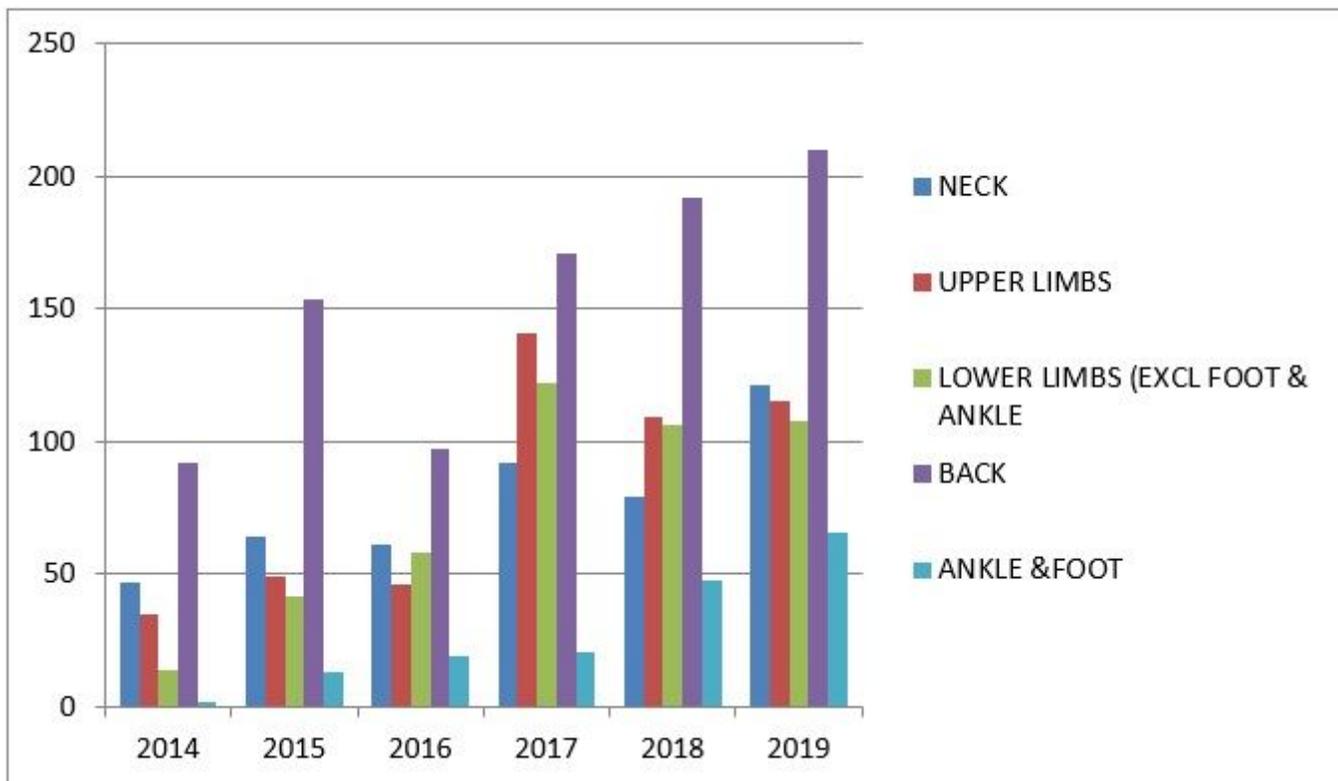


Figure 1

GRAPHICAL REPRESENTATION OF TABLE 1

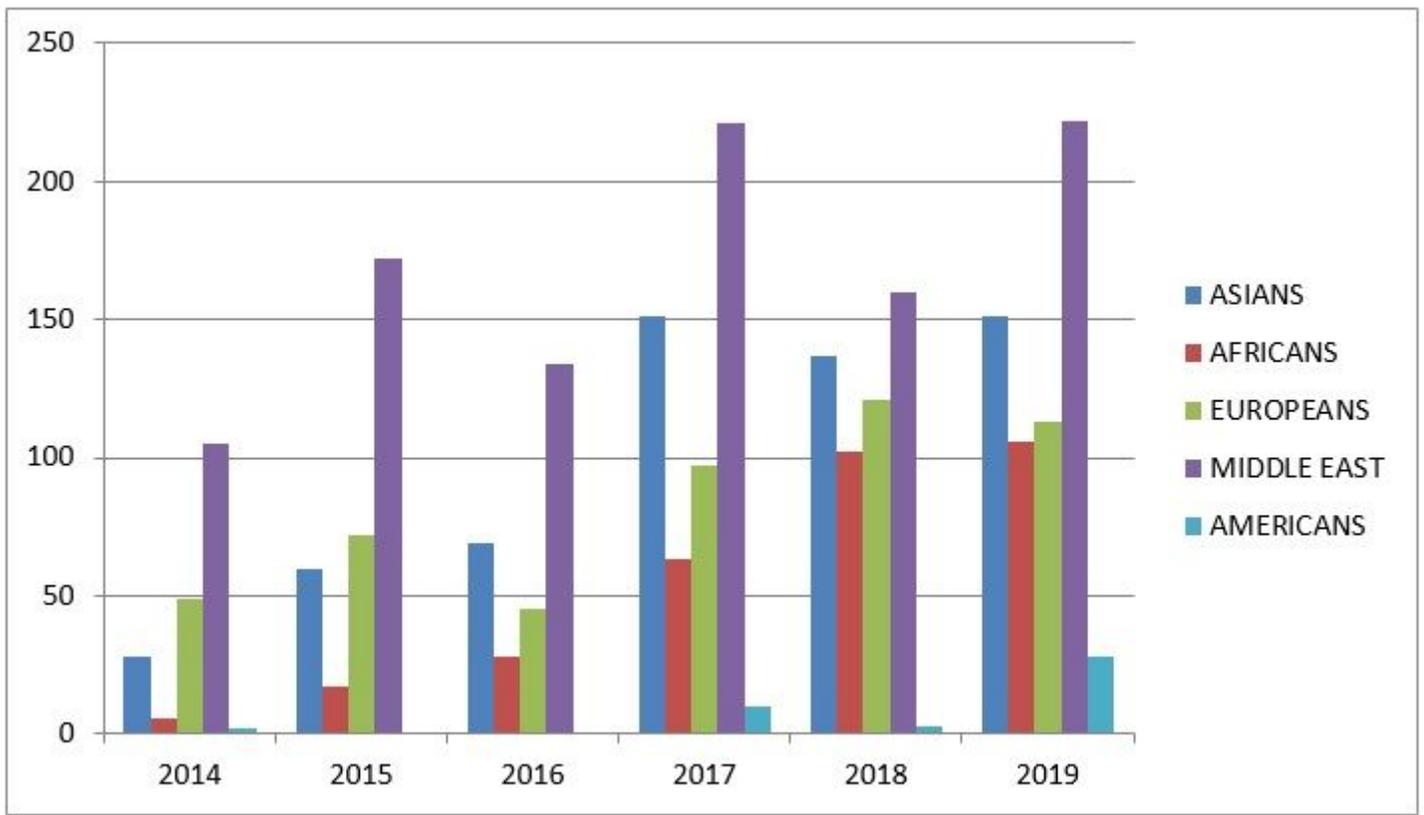


Figure 2

HISTOGRAM OF TABLE 2 STATISTICS

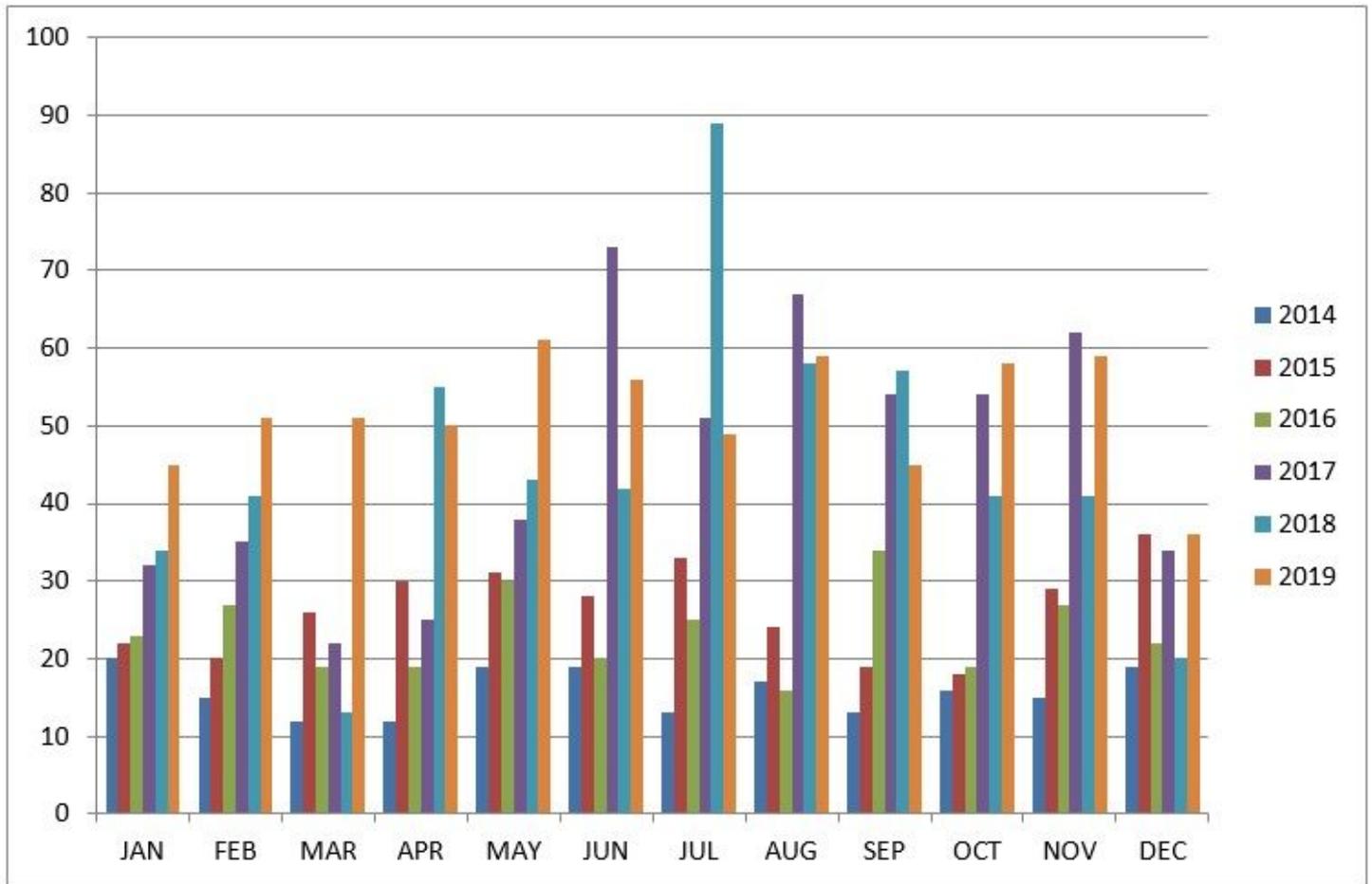


Figure 3

GRAPH DEPICTING THE MONTHLY DISTRIBUTION OF PATIENTS TREATED AT PHYSIOTHERAPY DEPT

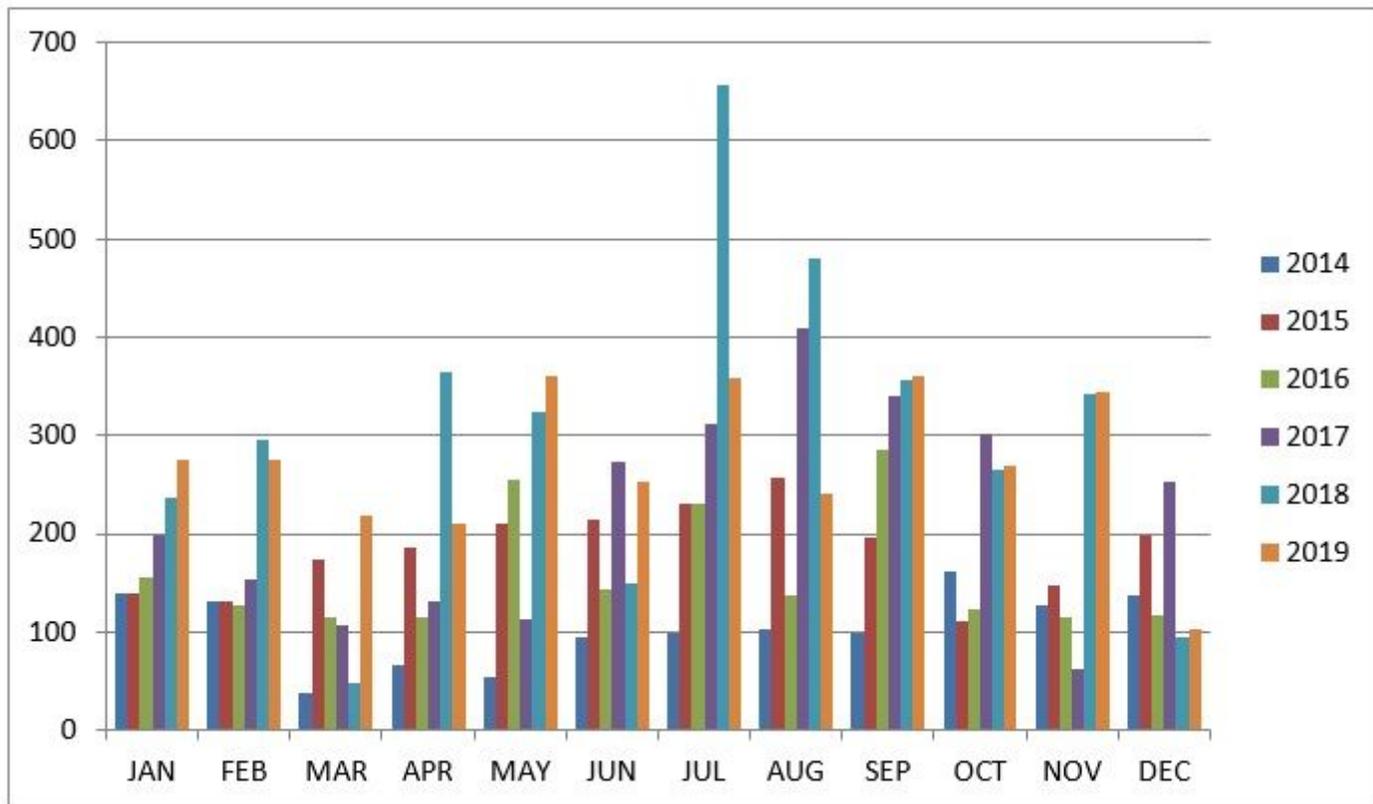


Figure 4

GRAPHICAL DATA DEPICTING MONTHLY LOAD OF PHYSIOTHERAPY SITTINGS