



Pattern and Physiotherapy Management of Shoulder Pain: A 5-Year Retrospective Audit of a Nigerian Tertiary Hospital

Olusola Ayanniyi¹, Olutade Joseph Dosumu¹, Chidozie E. Mbada²

¹ Department of Physiotherapy, College of Medicine, University of Ibadan, Ibadan, Nigeria

² Department of Medical Rehabilitation, College of Health Sciences, Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

Shoulder Pain (SP) is a common musculoskeletal problem and it constitutes a source of referral and workload for physiotherapy. This study investigated the pattern and management of SP in a physiotherapy department of a tertiary hospital. A five-year case chart review (January 2005 to December 2009) of patients with SP referred to the outpatient physiotherapy clinic of University College Hospital, Ibadan, Nigeria was conducted. Data were gleaned on patients' age, gender, occupation, referring diagnosis, physiotherapist's impression, side of affectation, functional limitation, associated co-morbidities and impairments, pattern of treatment and outcome assessment tools. A total of 4.316 case charts were reviewed over the time period, SP accounts for 2.8% with a female to male ratio of 6:4. The mean age of the patients was 50.6 ± 26.2 years and the age group for peak prevalence (43.8%) was 41-60 years. There was higher preponderance of left SP (51.2%) than right in the ratio of 5:4. SP resulted mostly from fracture (19.6%), osteoarthritis (10.7%) and dislocation (6.6%). SP led to functional limitation in personal care (23.1%), work (14.0%) and sleep (9.0%). The most prevalent musculoskeletal condition associated with SP was elbow pain (8.3%), knee pain (6.6%) and neck pain (5.0%) while hypertension (16.5%), diabetes (6.6%) and sickle cell (2.5%) were co-morbid medical conditions with SP. Reduced range of motion (73.6%), muscle atrophy (28.1%) and muscle weakness (27.3%) were the most associated impairments resulting from SP. Mobilization technique (76.0%), reciprocal pulley (62.8%) and hydro collar pack (62.0%) were often employed in the management for SP. The mean treatment duration of patients was 5.2 ± 2.4 weeks. Outcome assessments were documented in 82.6% of the cases. Goniometer (28.9%), oxford muscle grading (19.0%) and verbal rating scale (15.7%) were the most frequently used assessment tools. Shoulder pain is not an uncommon condition presenting for physiotherapy among Nigerian patients and it constitutes a small burden on the physiotherapy care at a tertiary hospital. The pattern and management of shoulder pain in this study is similar to findings from previous studies from around the world.

Keywords: Shoulder pain, pattern, physiotherapy management

(Rec.Date: Apr 29, 2015 Accept Date: May 20, 2015)

Corresponding Author: Dr. Olusola Ayanniyi Ph.D (PT), Physiotherapy Department, College of Medicine, University of Ibadan/ UCH, Ibadan, NIGERIA

Email: drayanniyi@gmail.com

Introduction

Musculo-skeletal disorders are common affliction of mankind and it seems that no part of human body is immune to this problem. According to some previous studies shoulder has been reported as the third most common site of musculoskeletal pain after low back pain [1] and knee pain [2]. Shoulder pain (SP) is recognized as a common complaint globally [2,3] and it is reported to be a frequent reason for consultation in clinical practice [4,5]. Prevalence of shoulder pain in the general population is estimated to be within 6-11% for people less than 50 years old and increasing to 16-25% in the elderly [6]. The overall annual prevalence and incidence for adults aged 18 years and above was 2.36 and 1.47% respectively in UK primary care setting, with rates increasing linearly with age [7]. Nevertheless, a considerable number of episodes of shoulder pain may remain unreported [8,9]. However, Brox [5] submitted that about half the population will have at least one episode of shoulder pain annually. Previous studies have highlighted some individual risk factors, such as age, arthritis, obesity, diabetes and thyroid disease [10-13], while a strong relationship between working conditions and shoulder disorders has been reported in other studies [14-16]. The gender impact on shoulder disorders are however not clear and is a topic of continue debate [17,18]. Some studies reported higher prevalence for female [4,19,20] while others found no strong link for gender bias in SP prevalence in the general population [7,21].

Shoulder pain is recognized as potential source of suffering among those affected and may persist for months or even years [4,22,23]. Such pain may also be associated with sleep disorders which in turn further perpetuates the suffering of the affected individuals [24]. Substantial disability and morbidity can result from shoulder disorders. Inability to work, loss of productivity and inability to carry out household activities can be a considerable burden to patient as well as to the society [25,26]. Some pathology is recognized as causes of shoulder pain these include articular or peri-articular rheumatic conditions. Osteoarthritis (OA) of the gleno-humeral joint is one of the most common causes of shoulder pain, which is more common in women and appears to increase with age [6]. Findings from other studies also identified tendinitis, bursitis and impingement syndrome, as the most frequent group of diagnoses for both women and men [4,15,27]. Adhesive capsulitis is another common cause of shoulder pain while septic and avascular necrosis are least common [24], while disorders of the cervical spine are also implicated as causes of shoulder pain [28]. It is recognized that

there are no universal criteria for differential diagnoses of various chronic pain syndrome affecting the shoulder joint complex or even consensus on their treatment [7,24,29]. The management of shoulder pain thus poses a big challenge to the entire medical team and physiotherapy inclusive [29,30]. There is a wide range of physiotherapy for shoulder pain such as exercises to strengthening muscles and increase range of movement; and modalities including ultrasound, cold or heat therapy and TENS to manage pain [30].

Studies from the industrialized nations indicated that SP constituted a tremendous burden on the healthcare system [7,20,31] particularly primary and secondary health care facilities. The main focus of the present study was to investigate the frequency of referral and pattern of management of patients with problem of SP seen over a five year period in a physiotherapy department of a tertiary hospital.

Materials and Methods

A case chart review of patients covering a period of five years was conducted at the out-patient department of University Teaching Hospital (UCH), Ibadan, Oyo state, Nigeria. The Hospital is strategically located in Ibadan one of the largest cities in Nigeria which is noted to be well served with health care facilities. Consequently UCH enjoyed a large referral base of patients from her immediate surroundings as well as from the entire country. Patient's register, referrals cards and case files of all patients diagnosed with shoulder pain and managed at the out-patient physiotherapy department of the Hospital, between January 2005 and December 2009 was retrieved and reviewed. The study was restricted to only new cases of SP referred for physiotherapy during the years under review. In this study patients were strictly categorised according to their year of admission into physiotherapy service. All the patients that were admitted into treatment in a particular year were classified under that particular year for the purpose of the study even when their treatment duration extended into another year. This approach eliminates the problem of patients overlap in our documentation. The patients' case files were reviewed from inception into the treatment through to discharge or termination of treatment.

Ethical approval for the study was granted by the University of Ibadan (UI) / University College Hospital (UCH) Ethics Committee. Permission of the head of department of physiotherapy in the hospital was obtained to carry out the study. Data gleaned from the case

charts included date of admittance into the clinic, gender, age, occupation of patient, doctor's diagnosis, physiotherapy impression of patient's condition, frequency of treatment, physiotherapy intervention given, duration of treatment received by patient (in weeks), total number of treatment session, outcome measures used and mode of termination of treatment.

The three principal investigators were responsible for gathering of the necessary information from the case files. Data for each of the years was crossed checked by a pair of the researchers in order to minimize errors in gathering and input of data for analysis. This role was revised throughout the study in order to ensure the correctness of data generated for the study.

Data Analysis

The data was analyzed using descriptive statistics of mean, frequency distribution and percentages. The data analysis was carried out using SPSS 13.0 version software (SPSS Inc., Chicago, Illinois, USA).

Results

A total of 4,316 case charts were reviewed over the time period, shoulder pain accounts for 121 (2.8%) cases referred for physiotherapy with a female (n=68) to male (n=53) ratio of 6:4. The annual distribution of referrals that accounts for SP is presented in Table 1. Patients' age, gender and occupational characteristics is presented in table 2. The mean age of patients was 50.6 ± 26.2 years and the age group for peak occurrence of SP was 41-60 years (43.8%). Table 3 shows the frequency distribution of impairment and functional limitations following SP. Pain constituted the main reason for referral for physiotherapy in all the patients (100%). The left shoulder was mostly affected (51.2%) while both shoulders were affected in 5.8% of the patients. 46.1% of the patients reported functional limitations mostly in personal care (23.1%) and work (14.0%). Table 4 shows that elbow pain was the most prevalent co-existing musculoskeletal condition associated with shoulder pain accounting for 8.3% while 23.1% of the patients reported co-morbid medical conditions at the time of presentation for treatment. Hypertension (16.5%) and diabetes (6.6%) were the most prevalent among the patients.

Fracture and dislocation caused by trauma was the most diagnosed cause of SP in the study (Table 5). Table 6 shows the frequency distribution of the different treatments employed in the management of shoulder pain. Joint mobilization was the most utilized mode of

physiotherapy management. Complete treatment profiles of the patients were documented in 82.6% of the patients. The mean number of treatment sessions received was 10.4 ± 4.6 . The mean treatment duration of patients was 5.2 ± 2.4 weeks while the modal duration of treatment was 3.5 weeks. Only 11.6% of patients were documented to have been properly discharged from treatment, 4 (3.3%) were referred back to the consulting physician while the mode of termination of treatment for the remaining 85.1% of the patients was not documented.

Table 1. Percentage of new referrals to physiotherapy department accounted for by shoulder pain.

Year	Number of total new referral during period under study	Number of new shoulder pain referrals during period under study	Percentage of new referrals that shoulder pain accounts for
2005	816	17	2.1%
2006	737	27	3.7%
2007	843	29	3.4%
2008	1037	24	2.3%
2009	883	24	2.7%
Total	4316	121	2.8%

Table 2. Age, occupation and gender distribution of the patients

Variables	Number (n = 121)	Percentage (%)
Age Distribution (Yrs)		
1 – 20	5	4.0
21 – 40	26	21.4
41 – 60	53	43.8
61 – 80	32	26.4
81 – 90	2	1.7
Not indicated	3	2.5
Occupation		
Military Personnel	2	2.0
Business executive	2	2.0
Clergy	4	3.0
Nursing	9	7.0
Students	11	9.0
Teaching	13	11.0
Trading	28	23.0
Civil servant	52	43.0
Gender Distribution		
Female	68	56.0
Male	53	44.0

Table 3. Distribution of reported impairments and functional limitation following shoulder pain

Variables	Number (n=121)	Percentage (%)
Impairment		
Pain	121	100
Swelling	4	3.3
Reduced Rom	89	73.6
Atrophy	34	28.1
Paresthesia	2	1.7
Muscle Spasm	4	3.3
Functional Limitations:		
Pain disturbs personal care	28	23.1
Pain disturbs work	17	14.1
Pain disturbs sleep	11	9.1
not indicate	65	53.7

Table 4. Frequency distribution of co-existing musculoskeletal and co-morbid medical conditions among the patients with shoulders pain

Variables	Number (n=121)	Percentage (%)
Musculoskeletal Conditions:		
Elbow pain	10	8.3
Neck pain	6	5.0
Knee pain	8	6.6
Spinal deformity	2	1.7
Hip pain	1	0.8
Wrist pain	1	0.8
LBP	1	0.8
Frozen hip	1	0.8
Co-morbid medical conditions:		
Hypertension	20	16.5
Diabetes	8	6.6
HbSS	3	2.5
HIV	2	1.7
Seizure	1	0.8

LBP: Low back pain

Table 5. Diagnosis of the patients shoulder pain

Diagnosis	Frequency (n=121)	Percentage of patients (%)
Fracture	24	19.6
Osteoarthritis	13	10.7
Dislocation	8	6.6
Rotator syndrome	6	5.0
Adhesive capsulitis	4	3.3
Calcific tendinitis of bicep	4	3.3
Impingement syndrome	3	2.5
Septic arthritis	1	0.8
Rheumatoid arthritis	1	0.8
Ankylosis	1	0.8
Bicipital tendinitis	1	0.8
Strain	1	0.8
Sprain	1	0.8
Metastasis	1	0.8
Cervical spondylosis	1	0.8
Undiagnosed	51	42.1
Total	121	100.0

Table 6. Frequency distribution of modalities used in treating patients (N= 121)

Modality	Frequency	Percentage of patients
Mobilisation	92	76.0
Reciprocal pulley	76	62.8
Hydrocollator pack	75	62.0
Shoulder wheel	40	33.1
IRR	38	31.4
SWD	31	25.6
Ultrasound	29	24.0
Finger ladder	21	17.4
Cryotherapy	17	14.0
Sandbag	16	13.2
Wall ladder	16	13.2
EMS	6	5.0
Dumbbell	2	1.7
Microwave	5	4.1

SWD: Short wave diathermy, EMS: Electrical muscle stimulator, IRR: Infra red

Discussion

This study investigated the referral pattern of patients suffering from shoulder pain in a tertiary hospital for physiotherapy; and identified the type of treatment received by the patients. The result showed that shoulder pain accounts for 2.1-3.7% of conditions referred for physiotherapy annually and constituted 2.8% of all cases referred for physiotherapy in a five year period covered by our review. This is comparable to the frequency reported among people consulting in primary care in U.K for one year [7]. However, the occurrence rate in this study represent those who were referred for physiotherapy by physicians after their initial consultation at the hospital while those of Linsell et al [7] captured total referral in UK primary care setting. From this study, the age group for peak incidence of shoulder pain was 41-60 years constituting 45.3% of the total population. Previous studies have submitted that older age is an important predisposing factor to shoulder pain [24,32,33]. However, the higher incidence of shoulder pain among middle age group in this hospital based study than that reported for older adults may be a reflection that these patients were seen within the confine of an health care facility and not from a community-based survey which is inclusive of general population.

The gender distribution with more affectation of females than males as observed in this study is supported by previous studies [24,33,34]. Similar gender pattern is seen in most types of musculoskeletal pain in other body regions [35,36]. Several sociological, cultural and physical differences have been proposed as explanations but these hypotheses have not been shown to be satisfactory [37,38].

Occupational profile of the patients seen in this study is much tilted towards people in white collar job and trading while other occupational group such as artisans and farmers are lacking. This may be a reflection of urban location of the tertiary hospital where the study was conducted or a reflection of patients' preference since the same service is equally available at most of the secondary health care facilities in the same community. The occurrence of shoulder pain among the different occupations as seen in this study is consistent with the findings from literature [25,39], where many factors influencing the occurrence of shoulder pain in work settings had been cited. Various musculoskeletal disorders and injury were implicated as the possible causes of shoulder pain among the patients. Furthermore,

difficulties has also been reported in arriving at specific diagnosis of shoulder conditions in patients since they often present similarly with regards to pattern of impairments with pain as the major symptom in many cases of shoulder dysfunctions [28,40,41]. In the present study no specific ICD coding was employed in diagnosis or in the categorization of the patients SP. Patients were diagnosed based on presumed pathological presentations, Utilization of a homogenous system such as ICD might have probably gone a long way in harmonizing clinical diagnoses among health care practitioners and minimize discrepancies in diagnosis as found between the referring consultants and the physiotherapists in this study. Another major finding from this study is a relatively high incidence of shoulder osteoarthritis as a cause of shoulder pain. Kerr et al [42] submitted that shoulder osteoarthritis is common but not exclusive to older persons. Although, shoulder osteoarthritis has no specific etiology, however, traumatic injury, chronic dislocations, infection, congenital malformations etc. are recognized precursors of shoulder osteoarthritis [42,43]. About one quarter of the patients' population in this study attributed the causes of their SP to specific problems of fracture sustained to humerus and dislocation injury to glenoid humeral joint respectively. This finding is supported by some previous studies [7,24] where shoulder pain was associated with an injury in one quarter of affected patients while in another study Wofford et al [33] reported that shoulder pain was associated with an injury in one third of the patients.

Shoulder pain has been reported to be associated with impairments and functional limitations [25,44,45]. Reduced range of motion, muscle weakness, muscle spasm, atrophy and paresthesia were the most reported impairments associated with shoulder pain among the patients in this study. This study corroborates previous studies that have identified absenteeism from work, impairment in personal care and sleep disturbance as predominant problems suffered by the patients with shoulder pain [23,46]. Pain in the left shoulder was found to be predominant, 51.2% compared to pain in the right shoulder reported by 43.0% of the patients, this is at variance to the findings of others [24,47] where pain in the right shoulder predominate. Our finding with respect to predominance of left shoulder pain may be a mere coincidental finding or it may be related to the causative factor of the SP one way or the other. However, it's pertinent to note that most of the patients in our study reported that their SP is secondary to traumatic injury. Musculoskeletal pain in other parts of the body was also reported by most of the patients and pain in the elbow was the most frequent among the

patients seen. This finding is in agreement with referral pattern for shoulder pain problems [3].

Hypertension was observed to be the commonest co-morbid condition among the patients seen; this may be because substantial numbers of the patients (16.5%) were elderly, since increasing age has been linked with development of hypertension [48]. This was followed by diabetes seen in 6.6% of the patients. From literature diabetes mellitus had been shown to be associated with shoulder pain especially adhesive capsulitis. This is consistent with previous findings [24,49]. Other conditions found among this group of patients such as HbSS, HIV, and seizure have been independently confirmed as potential causes of shoulder pain in the literature [50-53].

The general principles of physiotherapy management are applicable in all cases. These involved soft tissue massage, joint mobilization combined with application of superficial / deep tissue heating modalities and cryotherapy. Physical exercises were employed for mobilization of the shoulder joint to increase range of movement in stiff joints. This approach is in line with physiotherapy management of musculoskeletal dysfunctions [29].

Findings from this study indicated that patients stopped coming for treatment after five weeks with average of two treatment sessions per week. A similar trend was observed in patients treated for neck pain with physiotherapy where patients stopped coming for treatment after six weeks [54] without former discharge. Consequently, the patient's condition and reasons for termination of treatment was poorly documented as only 11.6% were formerly discharged by physiotherapists from treatment. On the other hand 3.3% of the patients were referred back to the referring doctors but with no documented feedback to the physiotherapists. The high percentage of patients (85.1%) that disengaged from treatment without being formally discharged by the attending physiotherapists' give rooms to a number of speculations on what may have given rise to such a situation. Previous studies have identified a number of barriers such as health care funding and ease of access to health care facilities as some of the factors that may hinder effective healthcare utilization among patients in developing countries of the World [55 -57]. Ease of access to health care facilities and funding are serious factors that must be taken into consideration in the care of patients. Physiotherapy services in Nigeria are mostly available at the secondary and tertiary health care level but not at primary health care

level which are closer to people than a tertiary hospital. Such an arrangement has been noted to be detrimental to the people located in the rural areas as it deprived them the ease of access to physiotherapy care [57-59]. With respect to health care funding, Nigeria government does not yet operate a full universal healthcare coverage. Conversely, out of pocket payment by patients is predominating while the national health insurance scheme that is in operation is predominantly targeted at Nigerian population employed in the formal sector of the economy [56]. Therefore, the present healthcare funding arrangement in place may have robbed appreciable segment of population of ease of access to desired healthcare services. With respect to the widespread self-discharge by patients from treatment that was documented in this study, information is lacking to make a categorical statement on what to attribute this problem to in this study.

Patients self-discharge from physiotherapy as documented in this study is an important problem that must be addressed since such patients practice deny the physiotherapists and the larger medical community the opportunity of capturing the essential information on the final status of such patients. This served as an important limitation in drawing a conclusive inference on the final status of patients seen in the period under review.

Conclusion

Shoulder pain is not an uncommon condition presenting for physiotherapy among Nigerian patients; however, it does not constitute a heavy burden on physiotherapy service in a tertiary hospital. The pattern and management of shoulder pain in this study is similar to findings from previous studies from around the world.

Acknowledgements

The authors gratefully acknowledge the help of all records officers at the physiotherapy Department, UCH, for their cooperation and assistance in sorting out the necessary patients' records. We also acknowledge the special assistance of the Deputy Director of physiotherapy Dr. Oladapo O. Taiwo, Messrs M.O. Moranti and B. Okikiolu for facilitating access to the physiotherapy patients' records.

References

1. Joud A, Petersson IF, Englund M. Low back pain-epidemiology of consultations. *Arthritis Care Res (Hoboken)*. 2012;64(7):1084-8.
2. Urwin M, Symmons D, Alison T, Brammah T, Busby H, Simmons A, Williams G. Estimating the burden of musculoskeletal disorders in the community the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis*. 1998;57(11):649-55.
3. Kelton MB, Herbert JS, Gregory RC, Justin D. Chronic shoulder pain: Part II. Treatment. *Am Fam Physician*. 2008;77(4):493-7.
4. van der Windt DA, Koes BW, de Jong BA, Bouter LM. Shoulder disorders in general practice: incidence, patient characteristics, and management. *Ann Rheum Dis*. 1995;54 (12):959-64.
5. Brox JI. Regional musculoskeletal conditions: Shoulder pain. *Best Pract Res Clin Rheumatol*. 2003;17(1):33-56.
6. Badley EM, Tennant A: Changing profile of joint disorders with age: findings from a postal survey of the population of Calderdale, West Yorkshire, United Kingdom. *Ann Rheum Dis*. 1992;51(3):366-71.
7. Linsell L, Dawson J, Zondervan K, Rose P, Randall T, Fitzpatrick R, Carr A. Prevalence and incidence of adults consulting for shoulder conditions in UK Primary care, patterns of diagnosis and referral. *Rheumatology (Oxford)*. 2006;45(2):215-21.
8. Badcock LJ, Lewis M, Hay EM, Croft PR. Consultation and the outcome of shoulder-neck pain: a cohort study in the population. *J Rheumatol*. 2003;30(12):2694-9.
9. Walker Bone K, palmer KT, Reading I, Coggon D, Cooper C. prevalence and impact of musculoskeletal disorders of the upper limb in the general population. *Arthritis Rheum*. 2004;51(4):642-51.
10. Luime JJ, Kuiper JJ, Koes BW, Verhaar JA, Miedema HS, Burdorf A. Work-related risk factors for the incidence and recurrence of shoulder and neck complaints among nursing-home and elderly-care workers. *Scand J Work Environ Health*. 2004;30(4):279-86.
11. Buckle PW. Work factors and upper limb disorders. *BMJ*. 1997;315(7119):1360-3.
12. Bodin J, Ha C, Chastang JF, Descatha A, Leclerc A, Goldberg M, Imbernon E, Roquelaure Y. Comparison of risk factors for shoulder pain and rotator cuff syndrome in the working population. *Am J Ind Med*. 2012;55(7):605-15.
13. Roquelaure Y, Bodin J, Ha C, Petit Le Manac'h A, Descatha A, Chastang JF, Leclerc A, Goldberg M, Imbernon E. Personal, biomechanical, and psychosocial risk factors for rotator cuff syndrome in a working population. *Scand J Work Environ Health*. 2011;37(6):502-11.

14. van Rijn RM, Huisstede BM, Koes BW, Burdorf A. Associations between work-related factors and specific disorders of the shoulder—a systematic review of the literature. *Scand J Work Environ Health*. 2010;36(3):189-201.
15. Roquelaure Y, Mariel J, Fanello S, Boissière JC, Chiron H, Dano C, Bureau D, Penneau-Fontbonne D. Active epidemiological surveillance of musculoskeletal disorders in a shoe factory. *Occup Environ Med*. 2002;59(7):452-8.
16. Leclerc A, Landre MF, Chastang JF, Niedhammer I, Roquelaure Y; Study Group on Repetitive Work. Upper-limb disorders in repetitive work. *Scand J Work Environ Health*. 2001;27(4):268-78.
17. Treaster DE, Burr D: Gender differences in prevalence of upper extremity musculoskeletal disorders. *Ergonomics*. 2004;47(5):495-526.
18. Hooftman WE, van Poppel MN, van der Beek AJ, Bongers PM, van Mechelen W. Gender differences in the relations between work-related physical and psychosocial risk factors and musculoskeletal complaints. *Scand J Work Environ Health*. 2004;30(4):261-78.
19. Bot SD, van der Waal JM, Terwee CB, van der Windt DAWM, Schellevis F, Bouter L, Dekker J. Incidence and prevalence of complaints of the neck and upper extremity in general practice. *Ann Rheum Dis* 2005;64(1):118-23.
20. Feleus A, Bierma-Zeinstra SM, Miedema HS, Bernsen RM, Verhaar JA, Koes BW. Incidence of non-traumatic complaints of arm, neck and shoulder in general practice. *Man Ther*. 2008;13(5):426-33.
21. Tekavec E, Joud A, Rittner R, Mikoczy Z, Nordander C, Petersson IF, Englund M. Population-based consultation patterns in patients with shoulder pain diagnoses. *BMC Musculoskeletal Disorders*. 2012;13:238.
22. Chard MD, Hazleman R, Hazeleman BL, King RH, Reiss BB. Shoulders disorders in the elderly: a community survey. *Arthritis Rheum*. 1991;34(6):766-9.
23. Kuijpers T, van Tulder MW, Geert JMG, van der Heijden GJMG Bouter LM and van der windt DAWM. Cost of shoulder pain in primary care consulters: a prospective cohort study in the Netherlands. *BMC Musculoskeletal Disorders*. 2006;7:83.
24. Adelowo OO, Oguntona S, Ojo O. Shoulder pain syndrome among Nigerians. *East African Medical Journal*. 2009;85(4):183-5.
25. van der Windt DA, Thomas E, Pope DP, de Winter AF, Macfarlane GJ, Bouter LM, Silman AJ. Occupational risk factors for shoulder pain: a systematic review. *Occup Environ Med*. 2000;57(7):433-42.
26. Jones JR, Hodgson J T. Clegg TA, Ellistt RC. Self-reported work-related illness in 1995; Norwick: HMSO, 1998.
27. Meislin RJ, Sperling JW, Stitik TP. Persistent shoulder pain: epidemiology, pathophysiology and diagnosis. *Am J Orthop (Belle Mead NJ)*. 2005;34(12 Suppl):5-9.
28. Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. *BMJ*. 2005;331(7525):1124-8.

29. Green S, Buchbinder R, Hetrick SE. Physiotherapy interventions for shoulder pain (Review), The Cochrane collaboration John Wiley and Sons, Ltd, 2010.
30. Arthritis Research UK. 2010;
http://www.arthritisresearchuk.org/arthritisinformation/arthritis_types_symoms/shoulderpain access date 22/09/2014
31. Greving K, Dorrestijn O, Winters J, Groenhof F, van der Meer K, Stevens M, Diercks RL. Incidence, prevalence, and consultation rates of shoulder complaints in general practice. *Scand J Rheumatol*. 2011;41(2):150-5.
32. Iannotti JP, Kwon YW. Management of persistent shoulder pain: a treatment algorithm. *Am J Orthop (Belle Mead NJ)*. 2005;34(12 Suppl):16-23.
33. Wofford JL, Mansfield RJ, Watkins RS. Patient characteristics and clinical management of patients with shoulder pain in U.S. primary care settings: Secondary data analysis of the National Ambulatory medical care survey. *BMC musculoskeletal Disorders*. 2005;6:4.
34. North West Adelaide Health Study. Musculoskeletal Conditions: Shoulder pain. *Epidemiological Series Report*. 2007;(16):1-4.
35. Scheider S, Randoll D, Buchner M. Why do women have higher back pain more than men? A representative prevalence study in the federal republic of Germany. *Clin J Pain*. 2006;22(8):738-47.
36. Wijnhoven HA, de vet HC, Picavet HS. Prevalence of musculoskeletal disorders is systematically higher in women than in men. *Clin J Pain*. 2006;22(8):717-24.
37. Andersson I H, Ejjertsson G, Leden I, Rosenberg C. Chronic pain in a geographically defined general population: Studies on differences in age, gender, social class, and pain localization. *Clin J Pain*. 1993;9(3):174-82.
38. Guez M, Hildingsson C, Nilsson M, Toolanen G. The prevalence of neck pain: A population-based study from northern Sweden. *Acta Ortho Scand*. 2002;73(4):455-9.
39. van der windt DA, Thomas E, Pope DP, de winter AF, Macfarlane GJ, Bouter LM, Silman AJ. Occupational risk factors for shoulder pain: a systematic review. *Occup Env Med*. 2000;57(7):433-442.
40. Bamji AN, Erhardt CC, Price TR, Williams PL. Clinical audit: The painful shoulder: can consultants agree? *Rheumatology*. 1996;35(11):1172-4.
41. Liesdek C, van Der Windt D AWM, Koes BW, Bouter LM. Soft-tissue Disorders of the Shoulder: A study of inter-observer agreement between general practitioners and physiotherapists and an overview of physiotherapeutic treatment. *Physiotherapy*. 1997;83(1):12-7.
42. Kerr R, Resnick D, Pineda C, Haghighi P. Osteoarthritis of the glenohumeral joint: a radiologic-pathologic study. *AJR Am J Roentgenol*. 1985;144(5):967-72.
43. Gerber A, Lehtinen JT, Warner JJ. Glenohumeral osteoarthritis in active patients: diagnostic tips and complete management options. *Phys Sports Med*. 2003;31(4):33-40.

44. Stevenson JH, Trojian T. Evaluation of shoulder pain. *J Fam Pract.* 2002;51(7):605-11.
45. Andrews JR. Diagnosis and treatment of chronic painful shoulder: review of nonsurgical interventions. *Arthroscopy.* 2005;21(3):333-47.
46. Croft P, Pope D, Silman A. The clinical course of shoulder pain: prospective cohort study in primary care. Primary care Rheumatology society shoulder study Group. *BMJ.* 1996;313(7057):601-2.
47. Leclerc A, Chastang JF, Niedhammer I. Incidence of shoulder pain in repetitive work. *Occup Env Med.* 2004;61(1):39-44.
48. Anderson GH. Effect of Age on Hypertension: Analysis of Over 4,800 Referred Hypertensive Patients. *Saudi J Kidney Dis Transpl.* 1999;10(3):286-97.
49. Cole A, Gill TK, Shanahan EM, Philips p, Taylor AW, Hill CL. Is diabetes associated with shoulder pain or stiffness? Results from a population based study. *J Rheumatol.* 2009;36(2): 371-7.
50. Ayanniyi O, Ayeni AOZ, Oni-Orisan MO. Musculoskeletal complications and status of individuals with sickle cell disease. *Nigerian Journal of Medical Rehabilitation.* 2006;11,2 (20):65-71.
51. David HG, Bridgman SA, Davies SC, Hine AL, Emery RJH. The shoulder in sickle-cell Disease. *J Bone Joint Surg (Br).* 1993;75B(4):538-45.
52. Connor-Read L, Bloch B, Brownlow H. A missed orthopaedic injury following a seizure: A case report. *Journal of Medical Case Reports.* 2007;10(1):20.
53. Lasanianos N, Mouzopoulos G. An Undiagnosed bilateral anterior shoulder dislocation after a seizure: a case report. *Cases J.* 2008;1(1):342.
54. Ayanniyi O, Mbada CE, Oke AM. Patterns and management of neck pain from cervical spondylosis in physiotherapy clinics in South West Nigeria. *Journal of Clinical Sciences.* 2007;7(2):1-5.
55. Bhattacharya O, Khor S, McGahan A, Dunne D, Daer AS, Singer PA. Innovative service delivery models in low and middle income countries-what can we learn from the private sector? *Health Research Policy and Systems.* 2010;8(24):1-11.
56. Mohammed S, Bermejo J L, Souares A, Sauerborn R, Dong H. Assessing responsiveness of health care services within a health insurance scheme in Nigeria: users' perspectives. *BMC Health Services Research.* 2013;13(502):1-13.
57. Akinpelu A, Odole A, Odejide A. Prevalence and pattern of musculoskeletal pain in a rural community in Southwestern Nigeria. *Internet Journal of Epidemiology.* 2010;8:2.
58. Abdulraheem IS, Oladipo AR, and Amodu MO. Prevalence and correlates of physical disability and functional limitation among elderly rural population in Nigeria. *J Aging Res.* 2011;2011:369894.
59. Igwesi-Chidobe C. Obstacles to obtaining optimal physiotherapy services in a rural community in southeastern Nigeria. *Rehabil Res Pract.* 2012;2012:909675.