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Occupational Disorders and Risk Assessment: A Systematic Overview

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ABSTRACT

Around the globe, work has heavy impact on the health. Any chronic ailment that results due to continuous work or any occupational activity can be known as Occupational disease. Various occupational exposures lead to different types of Occupational diseases. These can be caused by both 'exertional factors' and 'environmental factors' of which the former include injuries that are caused by the amount of physical exertion needed to perform the job and the latter refer to the presence of chemicals, dust, fumes, gases and other substances in the workplace.

However, it is not always that easy to designate a disease as being occupational. There are many diseases that could be related to occupation in one or the other way. On one hand there are some classical diseases which are occupational in nature and generally related to one causal agent. On the other hand, there are many kinds of disorders which probably include several possible causal agents without being related to occupation.

The present review discusses about the various types of common occupational disorders prevailing in different working fields, work compensation act and measurements and steps to be taken to prevent the occupational diseases according to the Occupational Health and Safety regards.

INTRODUCTION

Occupational disease, once called industrial disease may be a physical upset ensuing from the routine performance of one's skilled responsibilities. It will be referred as a definite disease or disorder as a result of the character of one's work. As an example, if one suffers a loss of hearing as a result of his/her exposure to loud industrial machinery for long periods, that hearing impairment is an occupational disease. A repetitive strain injury that results from performing repetitive physical tasks at work is additionally associate degree disease. A mineworker exposed to oxide dusts at work might develop the respiratory organ malady, silicosis, as an occupational disease.

Musculo-skeletal Disorders

Musculoskeletal disorders (MSDs) are impairments of body structures like muscles, joints, tendons, ligaments, nerves, bones or a localised blood circulation system caused or aggravated primarily by the performance of labour and by the results of the immediate setting wherever the work is dispensed [1-5]. MSDs will arise from a explosive labour like lifting a heavy object, or will arise from creating a similar motions continually or from repeated exposure to force, vibration, or awkward posture over an extended amount of time. The symptoms could vary from discomfort and pain to shrunken body performance [6-8]. Though it's not clear to what extent MSDs are caused by work, their impact on operating life is large [9-11]. MSDs will interfere with activities at work and might cause reduced productivity, illness absence and chronic occupational disability. Work related musculoskeletal disorders are also growing problems among nurses in many developing countries [12-15].

Musculoskeletal disorders are also frequent throughout agriculture work as a result of exposure to heavy, repetitive and forceful work, adoption of awkward and uncomfortable postures and carrying of excessive loads that has been determined to impose an impact on health of agricultural workers [16-18]. These factors place stress on muscles and joints, have an effect on the soft tissues of the neck, shoulder, elbow, hand, wrist, fingers and back. Additionally the normal agricultural tools and ways used for work need high human energy and might increase the chance of musculoskeletal injury [19-21]. Epidemiological and ergonomic Work-Related Musculoskeletal disorders (WMSD) research has captured a prominent position in the arena of occupational health due to the substantial financial cost and decreased productivity among employers and employees [22].

Work-related MSDs are the leading sorts of occupational injury and incur greater impact of cost to the industry and also the workers' compensation system. Pains and strains during work and at workplace are so serious and disabling for employees, inflicting pain and suffering starting from discomfort to severe incapacity [23-25]. The implications are way reaching and might have an effect on worker's life. MSDs are also expensive for employers [26-28]. They are the quantity one reason for lost-time claims reported to the workplace safety board, leading to vast direct and indirect expenses for employers. There is a robust link between exposure to the work-related risk factors for MSD and also the development of those disorders [29-31]. Taking proper measures to eliminate or reduce the exposure to the work-related risk factors will minimize the danger of MSDs. However, MSDs still be a serious source of disability and lost work time within the workplaces [32,33].

There has been an increasing effort in recent years to analyze the causes of MSDs and to take require action to stop them [34-37]. This has provided an intensifying recognition from workers, employers and government agencies that a strong relationship exists between factors inside the operating workplace surroundings and the development of MSDs [38,39]. The science of contemporary ergonomics and its application to MSDs associated with the modern workplace provide

both an important perspective and a preventative approach. The breadth and impact of ergonomics extends well beyond what is often presented in the literature [40-43].

Cardiovascular and lung disorders

Common occupational lung diseases include mesothelioma, occupational asthma, silicosis, asbestosis, and sick building syndrome [44-48]. They are often described to be specifically related to factors in the work environment; examples of such diseases are the pneumoconioses. [49] However, in addition to other exertional factors, occupational exposures also contribute to the development of common respiratory diseases, such as chronic obstructive pulmonary disease (COPD), asthma and lung cancer [50-52]. Chronic exposure to occupational noise may also be associated with increased occurrence of coronary heart disease (CHD) and hypertension [53,54].

The pneumoconioses, extrinsic allergic alveolitis [55-58], lung damage due to irritant gases, fumes, and smoke are the most important occupational lung diseases that affect the lung parenchyma. The pneumoconioses are the diseases which result from the accumulation of dust in the lungs [59-61]. The International Labour Organization (ILO) [62] has established a well-defined system for classification of these pneumoconioses that includes both descriptions of diffuse lung opacities and pleural disease [63,64]. The most common of the fibrogenic pneumoconioses are silicosis and asbestosis [65-68].

Chemical pneumonitis is caused by the exposure to toxic fumes. The acute disease may produce diffuse lung injury which is characterized by air-space disease typical of pulmonary edema [69].

The inhalation of certain agents causes acute injury to the respiratory tract of differing severity [70,71]. Occasional exposure to very high levels of metal fumes or organic dusts contaminated with microorganisms and endotoxins leads to metal fume fever and organic dust toxic syndrome, respectively [72-74]. These inhalation fevers are the clinical diagnosis of a relatively benign and transient. Such reactions generally occur in agricultural work [75].

Despite uncertainty about the number of people affected and risk factors for adverse pulmonary outcomes in this occupational setting, the Working Group recommended: standardized approaches to pre- and post-deployment medical surveillance [76-78]; criteria for medical referral and diagnosis; and case definitions for major deployment related lung diseases [79-81].

Cardiovascular disorders (CVDs) [82] are constituted as a major burden for health of working populations throughout the world of which 50% lead to death and at least 25% lead to work disability. There are some changes in cardiovascular risk factors among occupational classes [83]. This is mainly due to the evolution of new types of work-related causes of morbidity [84-86] which are associated with the recent developments in work life around the globe, particularly in the industrialized countries [87,88]. Meanwhile, in the developing countries or those in transition (e.g., in Eastern Europe), mortality is increasing due to major socioeconomic changes, the demographic transition and high industrialisation and urbanization [89,90], which are leading to growing challenges to cardiovascular health. Better control and prevention of known risk factors like smoking,

obesity, physical inactivity, high cholesterol, high blood pressure, and high blood glucose, is effective to prevent CVD incidence [91-93]. But the expected results were not been achieved. The obstacles of not achieving such control measures are due to lack of awareness, lack of policies and their implementation into practice and shortage of infrastructures and human resources [94-96].

Occupational risk assessment

The major purpose of risk assessment is to make the employer to take necessary measures in order to ensure the safety and health of workers in each and every aspect related to work [97]. According to European Union guidelines and practice, these measures include the prevention of occupational risks, the provision of controllable measures and training to employers [98]. Risk assessment usually focuses on the risks related to every workplace to evaluate the hazards and to estimate the likelihood of the potential for harm under the working conditions and its possible extent. The health assessment of the employees is not the single prominent goal of the risk assessment [99].

Risk assessment is a scientific method used to determine an individual's risk of developing a specific adverse health effect due to a specific exposure. There are primarily four components for the risk assessment or management. The first is the identification of the hazard, which is based on in vitro tests, animal bioassays, and epidemiological studies. The second component includes the dose-response assessment which deals with susceptibility, age, and the gene-environment. The third component is the exposure assessment that investigates the types, levels, and the duration of exposures. The final component is the risk characterization that deals with the nature of the risk, estimates the adverse effect of the worker, examines the robustness of the studies from the hazard identification, the susceptibility of the population, and the relevant of the mode of action [100]. Occupational risk assessment measures the risk factors for a specific disease from a specific exposure among individual workers.

REFERENCES

1. [In-Ju Kim. Musculoskeletal Disorders and Ergonomic Interventions. J Ergonomics. 2015 ; S4:S4-e002.](#)
2. [Ellapen TJ and Narsigan S. Work Related Musculoskeletal Disorders among Nurses: Systematic Review. J Ergonomics. 2014 ; S4: 003](#)
3. [Yitayeh A, et al. Annual Prevalence of Self-Reported Work Related Musculoskeletal Disorders and Associated Factors among Nurses Working at Gondar Town Governmental Health Institutions, Northwest Ethiopia. Emerg Med \(Los Angel\). 2014; 5: 227.](#)
4. [Vyas R. Ergonomic Assessment of Prevalence of Musculoskeletal Disorders among Indian Agricultural Workers. J Ergonomics. 2014; S4: 005.](#)
5. [Erick PN and Smith DR. The Prevalence and Risk Factors for Musculoskeletal Disorders among School Teachers in Botswana. Occup Med Health Aff. 2014; 2:178.](#)

6. [Georgoudis G, et al. Reliability Measures of Subcutaneous Pressure Pain Threshold Measurements: A Proposed Method of Assessing Painful Musculoskeletal Disorders. J Nov Physiother. 2014; 4:234.](#)
7. [Chim JMY. Ergonomics for the Prevention of Musculoskeletal Disorders of Computer Users in Hong Kong, Singapore and Japan. J Ergonomics. 2014; S4: 004.](#)
8. [Maduagwu MS, et al. Prevalence and Patterns of Work-related Musculoskeletal Disorders among Bankers in Maiduguri, Northeast Nigeria. Occup Med Health Aff. 2014; 2:169.](#)
9. [Majumdar D, et al. Work-related Musculoskeletal Disorders in Indian Nurses: A Cross-sectional Study. J Nov Physiother. 2014; 4:207.](#)
10. [Theofilou P and Panagiotaki H. The Association between Musculoskeletal Disorders and Quality of Life. J Trauma Treatment. 2011; 1:e101.](#)
11. [Amasay T. The Obesity Epidemic and Its Relation to the Prevalence of Musculoskeletal Disorders in Occupations that Service the Obese Individual. J Ergonom. 2012; 2:e107.](#)
12. [Zhang B, et al. Development of Toolkits for Hazard Identification, Risk Assessment and Prevention of Work-Related Musculoskeletal Disorders based on a Collaborative Platform. J Ergonomics. 2012; 1:108.](#)
13. [McCaffrey R and Park J. The Benefits of Yoga for Musculoskeletal Disorders: A Systematic Review of the Literature. J Yoga Phys Ther. 2012; 2:122.](#)
14. [Abledu JK and Abledu GK. Multiple Logistic Regression Analysis of Predictors of Musculoskeletal Disorders and Disability among Bank Workers in Kumasi, Ghana. J Ergonomics. 2012; 2:111.](#)
15. [Mesquita CC. Musculoskeletal Disorders in Workers-risk factors: What Can We Do? Occup Med Health Aff. 2013; 1:113.](#)
16. [Saltychev M, et al. Associations between ICF Categories Found Amongst Participants in Vocational Rehabilitation Evaluation Due to Chronic Musculoskeletal Disorders: Turku ICF Study: A Short Communication. Int J Phys Med Rehabil. 2013; S1:002.](#)
17. [Gupta G and Tarique. Prevalence of Musculoskeletal Disorders in Farmers of Kanpur-Rural, India. J Community Med Health Educ. 2013; 3:249.](#)
18. [Lin SL, et al. Translating Laboratory Research of BIOCERAMIC Material, Application on Computer Mouse and Bracelet, to Ameliorate Computer Work-Related Musculoskeletal Disorders. Transl Med. 2013; 4:122.](#)
19. [Yoo JH, et al. Genetics of Common Musculoskeletal Disorders in Adults. Orthopedic Muscul Sys. 2014; S2:S2-009.](#)
20. [Sell L, et al. A Tailored Learning Program for Prevention of Musculoskeletal Disorders. J Ergonomics. 2014 ; S4: 002.](#)
21. [Augusto TTR, et al. Cardiovascular Disease as Cause for Disability Pensions. Occup Med Health Aff. 2014; 2:186.](#)
22. [Alshahry AM. Epidemiology of Sharps Injuries in Eye Hospital in Saudi Arabia- 2013. Epidemiol. 2013; 3:121.](#)
23. [Price R and Burke J. Occupational Exposure to Asbestos: Mortality and Liability Issues Arising in Hong Kong's Shipping Industry. Air Water Borne Diseases. 2012; 1:101.](#)
24. [Gebreslase T and Buruh G. HIV Post-Exposure Prophylaxis Use and Associated Factors among Health Professionals of Governmental Health Institutions in Mekelle Town, Tigray Ethiopia, Cross-Sectional Study. J AIDS Clin Res. 2014; 5:313.](#)
25. [Bendetti D, et al. An Evaluation of Occupational Exposures to Pesticides in Brazil. Occup Med Health Aff. 2014; 2:170.](#)
26. [Were FH, et al. Respiratory Diseases Due to Occupational Exposure to Nickel and Chromium among Factory Workers in Kenya. J Community Med Health Educ. 2013; 3:252.](#)

27. [Augusto TTR, et al. Cardiovascular Disease as Cause for Disability Pensions. *Occup Med Health Aff.* 2014; 2:186.](#)
28. [Speziale M and Barbini N. Cardiovascular Risk for Workers in Big, Infrastructure Projects. *Occup Med Health Aff.* 2014; 2:175.](#)
29. [Maeda K and Nakano H. Systolic Fetal Heart Murmur Detected in Fetal Phonocardiography. *Occup Med Health Aff.* 2013; 1:102.](#)
30. [Szema AM. Occupational Lung Diseases among Soldiers Deployed to Iraq and Afghanistan. *Occup Med Health Aff.* 2013; 1:117.](#)
31. [Heyde AVD, et al. Counterproductive Work Behaviour in a Simulated Production Context: An Exploratory Study with Personality Traits As Predictors of Safety-Related Rule Violations. *J Ergonomics.* 2014; 4: 130.](#)
32. [Bhattacharjee A. Associations of Some Individual Occupational Factors with Accidents of Dumper Operators in Coal Mines in India. *J Ergonomics.* 2014; S5:001.](#)
33. [Dhande KK and Patil DY. Practical Approach towards Issue on Ergonomic Training with Respect to Productivity Improvement. *J Ergonomics.* 2013; 3:117.](#)
34. [Ponsa P. Complexity in Safety-Critical Systems. *J Ergonomics.* 2012; 1:e113.](#)
35. [Park H. Toward Finding an Optimal Balance between Function and Comfort in the Most Intimate Human Environment. *J Ergonomics.* 2012; 1:e114.](#)
36. [Pandve HT. Ergonomics Developments and Developing Countries. *J Ergonomics.* 2012; 1:e112.](#)
37. [Carnahan H, et al. Where is the Learner in Ergonomics? *J Ergonomics.* 2012; 2:e108.](#)
38. [Joshi P, et al. Conditions and Consequences of Involvement of Farm-women in Agriculture and Off-farm Activities in Mountain Region of Uttarakhand. *J Ergonomics.* 2014; 4:127.](#)
39. [Paes FJV, et al. Immediate Effect of Bilateral Talocrural Joint Manipulation on Postural Balance in Healthy Subjects. *J Ergonomics.* 2013 ; 3:122.](#)
40. [Singh S, et al. Anthropometric Measurements and Body Composition Parameters of Farm Women in North Gujarat. *J Ergonomics.* 2013; 3:114.](#)
41. [Okoth-Okelloh AM, et al. Occupational Health and Safety Administration \(OSHA\) in the Morgues: Management and Practice of the Universal Precautions in Morgues in Kenya. *Biosafety.* 2015; 4:121.](#)
42. [Abiko H. Extraction Rate of Low Concentration Organic Vapor Adsorbed in Activated Carbon Tube for Work Environment Measurement in Japan. *Occup Med Health Aff.* 2013; 1:129.](#)
43. [He X, et al. Single-Walled Carbon Nanotubes Induce Fibrogenic Effect by Disturbing Mitochondrial Oxidative Stress and Activating NF- \$\kappa\$ B Signaling. *J Clin Toxicol.* 2012; S5:005.](#)
44. [Ndubuisi Ezejiofor TI. Risk Assessment: Re-appraisals for Potential Hazards in the Operational Environment and Facilities of Petroleum Refining and Distribution Industry in Nigeria - Research and Review. *Occup Med Health Aff.* 2014; 2:187.](#)
45. [Colovic G. The Garment Manufacturers Risk Assessment – Swot Analysis. *J Textile Sci Eng.* 2014; 4:173.](#)
46. [Tziaferi SG. Occupational Risk Assessment and Genetic testing in the Workplace: Commentary on Lurati Ann R. \(2014\). *Occup Med Health Aff.* 2014 ;2:163.](#)
47. [Lurati AR. Occupational Risk Assessment and Genetic Testing in the Workplace. *Occup Med Health Aff.* 2014; 2:146.](#)
48. [Holla R, et al. Occupational Exposure to Needle Stick Injuries among Health Care Personnel in a Tertiary Care Hospital: A Cross Sectional Study. *J Community Med Health Educ.* 2014; S2:004.](#)
49. [Zaidi MA, et al. Healthcare Providers' Perspectives on Occupational Exposure to HIV: A Cross-Cultural Comparison. *J AIDS Clinic Res.* 2012; 3:179.](#)
50. [Hashmi A, et al. Prevalence of Needle-stick and Sharps Injuries among Healthcare Workers, Najran, Saudi Arabia. *Epidemiol.* 2012; 2:117.](#)

51. [Ravenna L, et al. Mesothelioma and Hypoxia: Modulation of the Inflammation-Related Phenotype and Identification of Prognostic Markers. J Cancer Sci Ther. 2014; 6:378-387.](#)
52. [Shukla A. Current Therapies for Malignant Mesothelioma. J Cancer Sci Ther. 2014; 6:306-309.](#)
53. [Donato V, et al. Malignant Pleural Mesothelioma: Management and Role of Radiation Therapy. J Nucl Med Radiat Ther. 2013; S2:011.](#)
54. [Pillai K, et al. Anti-Tumour and Chemosensitising Effect of a Combination of Bromelain + N-Acetyl Cysteine with Cisplatin or 5-Fu on Malignant Peritoneal Mesothelioma Cells. J Glycobiol. 2013; S1:005.](#)
55. [Edde P, et al. Pulmonary Lymphangitic Mesotheliomatosis. J Pulmon Resp Med. 2013; 3:136](#)
56. [H. Lee S, et al. Exploration of Biomarkers for Asbestos Exposure and Occurrence of Malignant Mesothelioma Based on the Immunological Effects of Asbestos. J Data Mining Genomics Proteomics. 2013; S2:001.](#)
57. [Brindley SM, et al. Attempted Validation of Surface Enhanced Laser Desorption Ionization-Time of Flight Derived Kinesin Biomarkers in Malignant Mesothelioma. J Data Mining Genomics Proteomics. 2013; S1:002.](#)
58. [Yan TD, et al. Analysis of Histologic Parameters Associated with Nuclear Size in Diffuse Malignant Peritoneal Mesothelioma Uniformly Treated by Cytoreductive Surgery and Perioperative Intraperitoneal Chemotherapy. Surgery. 2012; S8:001.](#)
59. [Okokon IB, et al. A Comparison Study of Traumatic Occupational Injury Burden by Departments in an Industrial Establishment in South-South Nigeria. Occup Med Health Aff. 2015; 3:193.](#)
60. [Gomez AMG, et al. Clinical Functioning in a Cohort of Patients with Severe Mental Disorder, before and after Joining a Workplace Reintegration Program. Brain Disord Ther. 2015; 4:159.](#)
61. [Alnunu MZ. Evaluation of Factors Affecting on Safety Performance at High Workplace in Gaza Strip 2014. J Civil Environ Eng. 2015; 5:167.](#)
62. [Maatoug J, et al. Three-Year Intervention Program to Prevent Hypertension in Workplaces in Tunisia: A Pre-Post Quasi-Experimental Design with Control Group. J Clin Trials. 2015; 5:202.](#)
63. [Faghri P and Mignano C. Overweight and Obesity in High Stress Workplaces. J Nutr Disorders Ther. 2013; 3:e110.](#)
64. [Baek S, et al. Applying Peer Counselor Concept at Workplace and Pilot Test for its Efficacy. J Psychiatry. 2015; 18:189.](#)
65. [Sugahara K, et al. Effects of Stress or Personality Types on Ocular Dryness, Dizziness, and Autonomic Nervous Dysfunction of Healthy Subjects in the Workplace. J Clin Exp Ophthalmol. 2014; 5:361.](#)
66. [Solani L and Cecaro M. Healthy People in Healthy Workplace: Philosophy and Practice of Workplace Health Promotion \(WHP\). J Mass Communicat Journalism. 2013; 3:e136.](#)
67. [Sjogren T, et al. Effects of Workplace Physical Exercise Intervention on the Physical Perceived and Measured Physical Functioning among Office Workers - A Cluster Randomized Controlled Cross-Over Design. Int J Phys Med Rehabil. 2014; 2:238.](#)
68. [Moen EB. The Importance of Walk-Through Surveys at Workplaces. Occup Med Health Aff. 2014; 2:171.](#)
69. [Carlsson RH, et al. Workplace Re-organization and Changes in Physiological Stress Markers. Occup Med Health Aff. 2014;2:148.](#)
70. [Bachman. Hazardous Chemicals in the Workplace. Occup Med Health Aff. 2013; 1:139.](#)
71. [Aguwa EN. A Review of Sir Thomas Legge's Aphorisms and Workplace Personal Protective Equipments " Is There Gap in Knowledge, Attitude and Utilization? Occup Med Health Aff. 2013; 1:134.](#)
72. [D'Alessandro A, et al. Coughing from Copiers? Workplace Induced Chronic Cough after Exposure to Laser Printer Exhaust. J Allergy Ther. 2013; 4:154.](#)

73. [Vafaei A and Kristman VL. Social Support in the Workplace and Workrelated Injury in Canada: A Cross-sectional Analysis. *Occup Med Health Aff.* 2013; 1:131.](#)
74. [Cecaro M and Isolani L. The Value of a Successful Communication in the Workplace Prevention. *J Mass Communicat Journalism.* 2013; S1:e001.](#)
75. [Weiss M. Nurturing a Healthy, Safe, Sustainable Workplace Culture. *Occup Med Health Aff.* 2013; 1:126.](#)
76. [Jensen S. Case Management and Care Coordination: Best- Practice Workplace Solutions. *Occup Med Health Aff.* 2013; 1:122.](#)
77. [Bondy SC. The Workplace and Communal Health. *Occup Med Health Aff.* 2013; 1:e102.](#)
78. [Zibe-Piegel VP and Boerngen-Lacerda R. How to Detect Early Harmful and Hazardous Substance Use in Workplace: A Qualitative Study. *J Alcoholism Drug Depend.* 2013; 1:104.](#)
79. [Findlay IM and Kowbel J. Engaging an Age-Diverse Workplace: Revisiting a Business Opportunity and Challenge. *J Bus & Fin Aff.* 2013; 2:e127.](#)
80. [Faghri PD, et al. 2012 Worksite Weight Loss Intervention for Employees in Stressful Workplaces: A Pilot Study and Baseline Survey Indicators of Success. *J Obes Wt Loss Ther.* 2013; 2:121.](#)
81. [Doukas N and Cullen J. Addiction Counselors in Recovery: Perceived Barriers in the Workplace. *J Addict Res Ther.* 2011; 2:112.](#)
82. [Seetharaman R and Lakshmi KS. Development and Validation of a Reverse Phase Ultra Performance Liquid Chromatographic Method for Simultaneous Estimation of Nebivolol and Valsartan in Pharmaceutical Capsule Formulation. *J Chromatograph Separat Techniq.* 2014; 5:229.](#)
83. [Wilson CR. Robustness of Industrial Crops in High Production Cost Agricultural Systems – Dealing with Market Flux. *Med Aromat Plants.* 2014; 3: e150.](#)
84. [Nevado JJB, et al. Reliable and Sensitive SPE-HPLC-DAD Screening of Endocrine Disruptors Atrazine, Simazine and their Major Multiresidues in Natural Surface Waters: Analytical Validation and Robustness Study Performance. *J Chromatograph Separat Techniq.* 2014; 5:215.](#)
85. [Anbumathi P, et al. Quantitative Analysis of a Dynamic Cell Cycle Regulatory Model of *Schizosaccharomyces pombe*. *Curr Synthetic Sys Biol.* 2013; 1:105.](#)
86. [Schrum AG and Gil D. Robustness and Specificity in Signal Transduction via Physiologic Protein Interaction Networks. *Clin Exp Pharmacol.* 2013; S3:001.](#)
87. [Passe U. The Next Challenges Ahead: Design Integration and Robustness. *J Archit Eng Tech.* 2012; 1:e105.](#)
88. [de la Rosa GE. The Insider Trading in the European Union Law. *J Civil Legal Sci.* 2014; 3:135.](#)
89. [Jason Goddard G. The Kano Model and the Future of the European Union: An Attitude Assessment of European Citizenry. *Bus Eco J.* 2014; 5:95.](#)
90. [Schauzu M. The European Union’s Regulatory Framework on Genetically Modified Organisms and Derived Foods and Feeds. *Adv Genet Eng.* 2013; 2:109.](#)
91. [Soni U and Singh M. Food Drug Administration vs. European Union. *Drug Des.* 2013; 2:105.](#)
92. [Simatovic J, et al. Characteristics of Individuals Admitted to the Intensive Care Unit for Asthma. *J Pulm Respir Med.* 2015; 5:256.](#)
93. [Albarran C, et al. Guidelines and Asthma: Some Considerations for Third World Countries. *J Pulm Respir Med.* 2015; 5:253.](#)
94. [Soni P and Sunil Kumar M. A Study on Prevalence of Tobacco Use among Children: A Literature Review. *J Alcohol Drug Depend.* 2015; 3:187.](#)
95. [Cantani A. Children with Chronic Asthma Have a Significant Sensitization to Multiple Aeroallergens: A Prospective Study in 74 Children. *Interdiscip J Microinflammation.* 2014; 1:124.](#)
96. [Nan Lv, et al. Weight Management Interventions in Adult and Pediatric Asthma Populations: A Systematic Review. *J Pulm Respir Med.* 2015; 5:232.](#)

97. [Hudd TR, et al. Survey of Certified Asthma Educator \(AE-C\) Pharmacists – Who are they and how is this Credential Being Used?. J Pulm Respir Med. 2014; 4:223.](#)
98. [Sabbah I, et al. Influence of Air Quality Conditions on Asthmatic Patient Visits in Kuwait. J Allergy Ther. 2014; 5:197.](#)
99. [Mickleborough TD and Lindley MR. The Effect of Combining Fish Oil and Vitamin C on Airway Inflammation and Hyperpnea-Induced Bronchoconstriction in Asthma. J Allergy Ther. 2014; 5:184.](#)
100. [Farid Shafei H, et al. Quality of Life in Some Asthmatic Children Treated with Homeopathic Remedies and their Parents. J Homeop Ayurv Med. 2014; 3:159.](#)