0.001]. Moreover, respondents from urban areas were found to have better knowledge (12.06 ± 3.82) than rural participants (8.38 ± 4.92, t = 20.00, P < 0.0001). In terms of level of income those with high income (12.37 ± 3.79) have significantly better knowledge than low income (8.00 ± 4.85), (F = 5.3, P < 0.0001)]. CONCLUSIONS: The level of knowledge about TB among TB patients was a low. Therefore, there is a need for massive health education campaign to be undertaken by policymakers in order to improve TB patients’ knowledge toward TB.

**EVALUATING SAFETY OUTCOMES OF LONG-ACTING BETA AGONISTS (LABAS) IN PATIENTS WITH ASTHMA**

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OBJECTIVES: The use of long-acting beta agonists (LABAs) has raised safety concerns, especially the potential for severe asthma exacerbations (SAEs). The purpose of this review was to review the published safety outcomes research about LABA therapy and compare disease epidemiologic trends.

METHODS: A systematic literature review was conducted with the specific focus on safety outcomes research from clinical trials, meta-analyses, and post-marketing studies. Patients with asthma were reviewed and compared between races, and between age groups. SAEs were defined as either asthma-related death, hospitalization or emergency room visits. Seven major studies were identified and reviewed. Annual mortality rate and SAE trends for asthmatic patients and subgroup of African American patients were compared.

RESULTS: The prevalence of asthma increased from 5% in 1992 to 7.8% in 2006, while mortality rate decreased from 1.7 per 100,000 in 1999 to 1.2 per 100,000 in 2006. Multiple clinical trial data showed that LABA monotherapy may be associated with increased risk of asthma exacerbation or asthma related death. On the other hand, meta-analyses showed that the use of LABA with ICS may be associated with positive outcomes including symptom reduction, quality of life improvement, reduced rate of exacerbations and severe exacerbation. Due to the limited data, the relationship between LABAs and an increased risk of severe asthma exacerbation is unclear, especially in pediatric and African American patients. Due to safety concerns, the US FDA made several label changes to warn the public about LABA therapy and has requested more assessments of LABA use in asthma patients.

CONCLUSIONS: The safety outcomes of the use of LABAs for the asthma treatment remain controversial. More well-designed research is required to assess the risk of SAEs related to LABA therapy in different populations.

**BURDEN OF SMOKING RELATED MAJOR DISEASES IN INDIA: ESTIMATION OF DIRECT OUT-OF-POCKET COST**

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OBJECTIVES: To estimate the direct out-of-pocket medical costs of treating major diseases attributable to smoking in India. METHODS: Indian data on burden of smoking related illnesses was compiled on lines of the BENSESCO (Benefits of smoking cessation on outcomes) model by secondary analysis of existing datasets from census and National Sample Survey (NSS), 2004. The prevalence of smoking (cigarettes and bidi) was estimated by adjusting census projected population with smoking rate found in Indian National Family Health Survey–III, 2005–2006. Data on age, gender and disease prevalence and unit cost of treatment of diseases was obtained from NSS. A prevalence-based, disease-specific approach was used to estimate the direct medical costs of treating cancer and other tumors, bronchial asthma, tuberculosis, respiratory diseases, hypertension and coronary heart disease attributable to smoking.

RESULTS: Analysis of data from NFHS–3 estimated that there were 98.2 million male and 4 million female smokers in India between 15 to 49 years of age. A total of 1.1 million hospitalizations and 90.5 million outpatient visits for 6 major diseases among adults were attributed to smoking annually. The total annual direct out-of-pocket medical cost for treating 6 major diseases was found to be Indian National Rupees 19 billion (US$ 4.4b). The total cost attributable to smoking was estimated to be INR 46 billion (US $1b) (i.e., 23% of the total); INR 33.8 billion (US$ 7.6b) for outpatient care and INR 12.2 billion (US$ 2.76b) for inpatient care. The total annual smoking attributable cost of treatment was highest for heart disease at INR 14.5 billion (US$ 227m) followed by bronchial asthma INR 8.8 billion (US$199m) and hypertension INR 8.6 billion (US$195m). CONCLUSIONS: The smoking epidemiology in India is a major preventable public health problem. The direct out-of-pocket medical costs of treating major diseases attributable to smoking are high.

**THE EFFECT OF UNCONTROLLED ASTHMA ON HEALTH-RELATED QUALITY OF LIFE AND RESOURCE USE IN JAPAN AND THE UNITED STATES**

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OBJECTIVES: The aim of the current study was to determine the burden of illness associated with uncontrolled asthma in both the United States and Japan. METHODS: Data were obtained from the 2009 US and 2008 Japan National Health and Wellness Surveys (NHWS), cross-sectional Internet-based surveys of adults. Only patients who were diagnosed with asthma were included in the analyses. Using the Asthma Control Test (ACT), each asthma patient was categorized as having controlled or uncontrolled asthma and these groups were compared on health-related quality of life (mental component summary (MCS) and physical component summary (PCS) quality of life) and SF-12v2), the number of emergency room (ER) visits, and the number of hospitalizations controlling for demographics (country, age, gender, ethnicity, income, education) and patient characteristics (BMI and Charlson comorbidity index) in multiple regressions. RESULTS: In Japan, 64.8% of patients diagnosed with asthma were 6481 patients (8.5%) were diagnosed with asthma in the United States. Even after adjusting for demographics and patient characteristics, those with uncontrolled asthma reported significantly lower levels of MCS scores (MAdj 45.9, P 0.0001). However, only waist risk score (WHR) remained significant after adjusting for covariates. Among ethnicity groups, Latino ethnicity is 72% more likely to report a doctor visit (P 0.001) and ER visits (MAdj 0.51 vs. 0.24, P 0.0001) were both significantly higher for those with uncontrolled asthma.

**RACE AND ETHNICITY IN EMERGENCY ROOM AND NON-URGENT CARE VISITS AMONG LATINO CHILDREN SUFFERING FROM ASTHMA**

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OBJECTIVES: To identify differences in health-care utilization by race and Latino ethnicity among children with asthma and determine the relative contribution of predisposing, enabling, and unobserved factors in explaining these differences. METHODS: The California Health Interview Survey (CHIS) is a non-institutionalized household survey of California residents conducted bi-annually since 2001. Cross-sectional survey data were analyzed to identify differences by race and Latino ethnicity among children with asthma. After adjustment for sample weights and design effects, over 400,000 samples in the 2007 CHIS were calculated for children with asthma. Disparities in health-care utilization across all race/ethnicity categories were analyzed using multivariate logistic regression and negative binomial regression analysis. RESULTS: Mexican children with asthma are over 100% more likely to have an emergency room (ER) visit in the previous year (P 0.04) and 58% less likely to have a doctor visit (P 0.049) compared to White children with asthma after controlling for confounding variables. Among ethnicity groups, Latino ethnicity is 72% more likely to have an ER visit in the previous year and 38% less likely to have a doctor visit compared to Non-Latino ethnicity. Negative binomial regression results show that
A CASE STUDY EVALUATING MALAYSIAN COMMUNITY PHARMACY INCORPORATING PROFESSIONAL PRACTICES AND SERVICES

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OBJECTIVES: To evaluate the professional practices and services of the Malaysian community pharmacists, using a ‘simulated client’ interview method. The interview was carried out at two community pharmacies in the state of Penang. METHODS: The simulated client (PhD student at the School of Pharmacy, Universiti Sains Malaysia) visited two community pharmacists, “Pharmacy A” and “Pharmacy B” and asked for medications for his and her son’s “viral fever symptoms” respectively. The details were documented in a form developed by the researchers. RESULTS: The findings suggested a poor professional behavior and dispensing practices among both the pharmacies studied. Although, both of them asked the duration of the symptoms, they did not ask the age of the patient(s), presence of blood in sputum, previous history of presenting medical complaints, past medical history, drug history and smoking status. The nature of the sputum was asked only by the pharmacists at pharmacy B. The pharmacy A dispensed Tab. Clarithromycin 500 mg, Tab. Paracetamol 500 mg, and Azithromycin 500 mg for suspected 200 mg/5 ml for his son’s viral fever symptoms. The pharmacy B dispensed Tab. Cefuroxime 250 mg, Amoxicillin [claravulan acid powder for suspension 125 mg + 31.25 mg/3 ml, Lincus Dextrmethorphan + Pro-methacine + Pseudo-ephedrine + Paraben sebagai pengawet, and Tab. Green oats + Sea Buckthorn + Stinging Nettle + Tongat Ali + Damiana. The cost of prescription was RM 56.50 (US$ 16.14) for pharmacy A and RM 129 (US$ 45.15) at pharmacy B.

RESULTS: Tab. Cefuroxime 250 mg, Amoxicillin [claravulan acid powder for suspension 125 mg + 31.25 mg/3 ml, Lincus Dextrmethorphan + Pro-methacine + Pseudo-ephedrine + Paraben sebagai pengawet, and Tab. Green oats + Sea Buckthorn + Stinging Nettle + Tongat Ali + Damiana. The cost of prescription was RM 56.50 (US$ 16.14) for pharmacy A and RM 129 (US$ 45.15) at pharmacy B.

CONCLUSIONS: Our findings suggested the need for continuing pharmacy education (CPE) programs for the community pharmacists in the country and need for curriculum changes incorporating more topics related to community pharmacy practice. Though our survey included only two community pharmacies, it can serve as a pilot study for future in depth survey encompassing various regions in Malaysia.