

AIR AWARE: A SMARTPHONE APP TO INCREASE AWARENESS OF ENVIRONMENTAL FACTORS TRIGGERED FOR SYMPTOMS OF BREATHING-RELATED ILLNESSES

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ABSTRACT

Breathing-related chronic illnesses such as asthma and chronic obstructive pulmonary disorder (COPD) affect millions of people. People with these conditions are especially impacted by environmental and weather-related factors that contribute to symptom exacerbation. This includes worsening dyspnea, anxiety, fatigue and depression. Self-monitoring of symptoms is becoming an increasingly popular tool in treatment for these illnesses. One such tool is being developed by the Department of Medical Social Sciences (MSS) at Northwestern University Feinberg School of Medicine. This tool is an iOS based mobile application that incorporates validated measures from the NIH PROMIS system with publicly available environmental and weather-related data through RSS and API interfaces. The application associates a person's dyspnea, anxiety and fatigue symptoms with environmental variables such as pollution and pollen levels and weather related data such as temperature and humidity levels for a given GPS location. These variables are obtained by calling publicly available web services that take GPS data as inputs. The GPS readings are obtained through the GPS API available in the iOS devices. Since a person's sensitivity to these external factors is highly individualized, the application first prompts users to complete a short battery of PROMIS computer adaptive tests (CAT) under a variety of environmental conditions and then calculates correlation coefficients. These prompts are enabled through the notification system available in the iOS platform. CATs reduce patient burden by administering highly targeted items to the user and stops when enough information is received. Once the application has collected enough data to determine if a correlation(s) exists, it will alert the user when environmental or weather conditions are at a level that would indicate a symptom is likely to occur. Since correlation does not equate causation, the application does not provide specific treatment recommendations for the symptoms; instead it aims to increase awareness of the existing conditions and how it may affect one's immediate well-being. User acceptance and effectiveness will be evaluated in a future feasibility study. This will aid in the refinement of criteria for determining the alert mechanism based on historical stored data.