Investigating the Efficacy of Adopting Asthmapolis Sensors in the Workplace: A Computer Science Perspective

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***Abstract*---** Contemporary health care approaches have been exposed to a workplace environment that is characterized by changing needs of patients, as well as alterations in the goals and objectives of the stakeholders (Caballero & Hullin, 2010). This trend continues to attract in-depth analysis on the manner in which technologies could be incorporated into care provision to achieve improvements in patient outcomes (Toole, 2013; Liaw & Gray, 2010). Specifically, technological adoptions have been perceived to account for creativity, inventions and innovations occurring in the health care sector (Rosser, Colwill, Kasperski & Wilson, 2010).

***Keywords*---** Contemporary health, Workplace, Sensors

I. INTRODUCTION

ACCORDING to the Global Initiative for Asthma (2012), Asthmapolis sensors refer to mobile applications that track the trigger, symptoms and use of medication among individuals suffering from asthma. The sensors operate alongside Bluetooth technologies in the users' phones by pairing the devices to foster automatic capturing of data from the sensors and storing, to be transferred to the phones for observation, analysis and interpretation. The data collected concerns the frequency of attack, interval of inhaler medical use, location of medications and, the date and time of medication. The purpose of monitoring asthma using Asthmapolis sensors is to enable the care providers to make informed decisions by reducing overreliance on the patients' memories. Specifically, data from the sensors aids in situations that may prompt alterations to therapy provision. Overall, Asthmapolis sensors are crucial and emergent technologies whose timely arrival and application in the current health care sector proves critical in reducing medication errors. Furthermore, Asthmapolis sensors provide data for use by physicians in remote monitoring of symptoms and determining when changes in therapy can be implemented (Reid, Fishman & Yu et al., 2009).

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II. Potential Barriers

Asthmapolis sensors are important because they promote convenience and reduction in medication errors. However, the demerit of using such applications arises when illiterate patients are handled; as the group is unlikely to adhere to the instructions and use the applications as required. Furthermore, the mobile information technology falters in such a way that it reduces the provider-patient interaction, a critical element in fostering health care among asthmatic patients. Overall, there is a need to adopt Asthmapolis sensors in mobile information technologies but the manner in which they should be applied should match with the conditions, literacy level, and needs of patients.

Additional challenges arise because of the need to observe the patients' privacy and, security reasons. Furthermore, the mobile information technologies pose a social concern regarding data disclosure. Persons to whom patient data should be disclosed is reported as one of the huddles faced by care providers, as patients who may be reluctant to use the devices express concern regarding the privacy of their personal information. Regarding the cost of mobile information technologies, a general concern by care providers is that the applications form a burden on the part of health care organizations and patient groups. Solutions to be barriers may include sensitizations of masses regarding the criticality of adopting Asthmapolis sensors, embracing transactional and transitional leadership, and utilizing feedback from patients and employee groups to work on the weaknesses of implementation while sustaining the strengths.

III. A Change Management Strategy

Given that the use of Asthmapolis sensors is a patient-centered approach, Orem's Self-Care Deficit Theory forms a foundation from which implementation efforts can be guided. The Theory suggests that self-reliance is a necessity among populations. Emphasis is on self-reliance in which populations take responsibility of caring for themselves and extending the services to others in the immediate environment. According to the Global Initiative for Asthma (2012), effective action planning arises from human interaction. The planning process is particularly perceived to be successful when primary care provision is preceded by effective development of requisites. From the affirmations, aspects of health promotion and self-care are determined by the people's knowledge of the problem. Additionally, socio-cultural settings ought to provide an ideal context in which self-care and dependent care services are established. To assure the effectiveness and success of Asthmapolis sensor utilization, mass sensitization could be conducted through seminars and other health care workshops.

IV. Computer Science Implications for Nursing

It is now indisputable that computer development is one of the most widely celebrated technological revolutions. Computers have transformed human lives in various ways that cannot be overemphasized. The basic concept that underlies computer development is artificial intelligence. The concept involves machines, as well as the science that creates it. It shapes human intelligence characteristics such as natural language processing, perception, planning, problem-solving, learning, and adaptation. According to Ford (2015), the documentation of whether artificial intelligence could attain the perfection to match human intelligence is as old as 1950. In 1957, Simon Herbert, having succeeded in developing the General Solver Program, had gone ahead and expressed hope that a computer would emerge as a chess champion, discover and even prove mathematical concepts; events that would ultimately see a majority of psychological theories operate in a similar fashion as computer programs. The eventuality was

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that the world became so expectant that the arrival of intelligent machines was imminent. However, Dreyfus expressed his positions that such optimism was totally unwarranted. Dreyfus explained that expertise and human intelligence is primarily a two-fold form of dependent instincts that are unconscious. This point was met with opposition and it was not until 1980 that artificial intelligence researchers, who were working on a robot, concurred with Dreyfus.

Unlike traditional approaches to computer operations, the current IT and software development sector operates in such a way that practices do not guarantee hardware or technical support. This situation is informed by the fact that there are various versions of computers and software, which are owned by different developers. Thus, technical support would only depend on the cooperation of system developers. For instance, users whose systems develop problems would only have to consult their mother company developers. However, despite the fact that there is a lacking professional support, one can always receive appropriate technical advice from online forums. Social networking sites post import information regarding common and technical problems in computer operations, saving the potential users from possible distractions and discouragement.

V. THE NEED FOR RESOURCES

To adopt Asthmapolis sensors, care providers ought to utilize various resources. For instance, adequate staffing is required because changes in the people's lifestyles have led to the prevalence of chronic conditions, including asthma. The projection is that the care providers are likely to be overburdened with the population of patients, hospitalization, and rehospitalization that occur at a time when sections of patients are discharged and allowed to use the Asthmapolis sensor while away from care facilities. The adoption of Asthmapolis sensors prompts stakeholders to employee "float staff" groups that may help in monitoring patient records. The application is also demanding in such a way that devices are used on the part of the patient, as well as the care provider's side (which forms the recipient of the data). The implication is that patients are expected to have Smartphones to be used alongside the sensors (which are attached to the inhalers) while care providers are expected to have devices on their part to detect aspects such as alterations in the criticality of the condition. In summary, the adoption of Asthmapolis sensors operates on a two-way basis by prompting the patients to acquire Smartphones to be used alongside the sensors while care providers are expected to facilitate staffing processes for better service provision.

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