

Hospital beds wireless sensor network and reducing decubitus ulcer

Sir,

Decubitus ulcer is a common and serious problem for inpatients in hospital. When someone is in sleep mode, pressure of his body weight enters at certain points and in the long-term, this will result in bruises and ultimately incurable wounds; therefore, hospital staff has to rotate these patients on their beds regularly to prevent it from happening. Due to the fact that prevention is more cost-effective than treatment and with the great cooperation of healthcare staff in the prevention of decubitus ulcer, decubitus ulcer is still as a significant problem for certain patients in hospital and society. Using wireless sensor network in hospital beds, which is known as smart beds is an appropriate solution to prevent decubitus ulcer and a way to forger the pressures of decubitus ulcer in patients hospitalized for a long time. In this regard, results of Chenu *et al.* study in 2013 entitled "an innovative embedded device for pressure ulcer prevention" showed that the decubitus ulcer prevention device for patients with spinal injury, which has the size of cigarette box and is embedded in a wheelchair, can be effective in preventing them. The device sensor is 100% textile, washable and inexpensive. The device function is to announce acquired alarm via watch or SMS in a smartphone before symptoms develop decubitus ulcer and by measuring the pressure between the seat mattress and patient's hip.^[1] Yousefi *et al.* in their study, in 2011 entitled "a smart bed platform for monitoring and ulcer prevention" defined hospital smart bed as a bed with a sensor network, information devices, tile such as surface and computer control. This bed function was to analyze data by creating touch and pressure on surface sensors and creating irritation and then announce acquired alarm to the nurse to prevent ulcer pressure. Thus, the nurse spends more time for assessing events adverse and outcomes and patient's care instead of rotating patient every moment.^[2] Since decubitus ulcer is a big problem in health care of patients with spinal injuries and these patients have no feeling for changing their status in comparison with healthy people, using a mattress with sensor is useful to diagnose the patient's problem and patient's tactile response. Using such system is useful in rehabilitation and is suitable for preventing decubitus ulcer.

In a study done by Verbunt and Bartneck, in 2010 entitled "tactile feedback for the prevention of decubitus ulcers," a technology is defined which is able to diagnose patient's inappropriate status and present an instruction to change his status. Changing status resulted in less risk of decubitus ulcer. This device includes a belt that receives a simple tap to a strong pressure as a signal, and this signal announces changing patient's natural status to patient and health care providers.^[3] Wireless sensor networks are increasingly changing for telemedicine applications, monitoring patients, both in clinical conditions and at home. Using them will reduce user's discomfort and expenses, and increase mobility. Using smart systems and wireless sensor networks, depending on users' needs, will also collect information regarding users and their environment.^[4] In smart beds, to enhance the capabilities of the bed and its physical characteristics, smart beds are made by a combination of a sensor network, information devices and control by computer, which is able to generate waves and signals for mobility and increasing blood flow in inpatients and prevents decubitus ulcer and lesions resulting from hospitalization.

Therefore, for decubitus ulcer prevention smart beds are useful especially for elderly people, patients with prolonged hospitalization or no motion and hospital staff in order to monitor patients' treatments and decubitus ulcer and widespread use of it needs experienced specialists and relevant systems focus.

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Conflicts of interest

There are no conflicts of interest.

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