Usability Assessment of Albus Home Contactless Device for Long Term Nocturnal Monitoring in Children With Asthma

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Rationale: Asthma attacks result in significant morbidity to children, caregivers and increase in emergency visits. Asthma attacks can be fatal. Early recognition and management of worsening symptoms at home can potentially prevent an attack. However, existing home monitoring tools rely on subjective recognition and reporting of symptoms. Tests such as peak-flow and lung function are limited by poor usability and carer burden. Additionally, emerging tools such as wearable devices lack long term usability data (Shin: 2019). Albus Home is a passive contactless device that detects changes in cough and respiratory rate providing a potential therapeutic window to prevent attacks in children. We describe the usability of this tool for long term daily use as reported by children and caregivers. **Methods**: Children with asthma aged 6-16 years recruited into the Childhood Home Asthma Monitoring (CHAMP) study and their caregivers completed the System Usability Scale (SUS) (Bangor:2008). Participants in the study had nightly monitoring of the physiological parameters by the Albus Home contactless device for up to 12 months. SUS is a widely used and validated instrument to assess the usability of a system (Lewis:2018). It comprises 10 questions on a Likert five-point scale, with 5 questions asked positively and negatively respectively. The SUS score is computed across 10 questions and ranges from 0 to 100.), A score over 80 demonstrates excellent usability. **Results:** Of 96 participants who started Albus Home monitoring, SUS responses were obtained from 74 (77%) families (mean child age 11, SD 4; 43M:31F). SUS responses were completed by 70 caregivers, and by 25 children with asthma (mean age 13, SD 2), after they had used the Albus Home for median of 10 months. The median caregiver and child SUS scores were 86 and 80 respectively (Figure 1). Ninety one percent of caregivers reported that the “Albus Home was easy to use” and “felt very confident using Albus Home”. **Conclusion:** The usability assessment of the Albus Home contactless monitoring system yielded highly positive results with the majority of caregivers and children reporting favorable usability experience. Feedback from children and caregivers was useful in developing the second generation Albus Home solution. These insights highlight the potential of integrating Albus Home for long term daily use in asthma management in children.

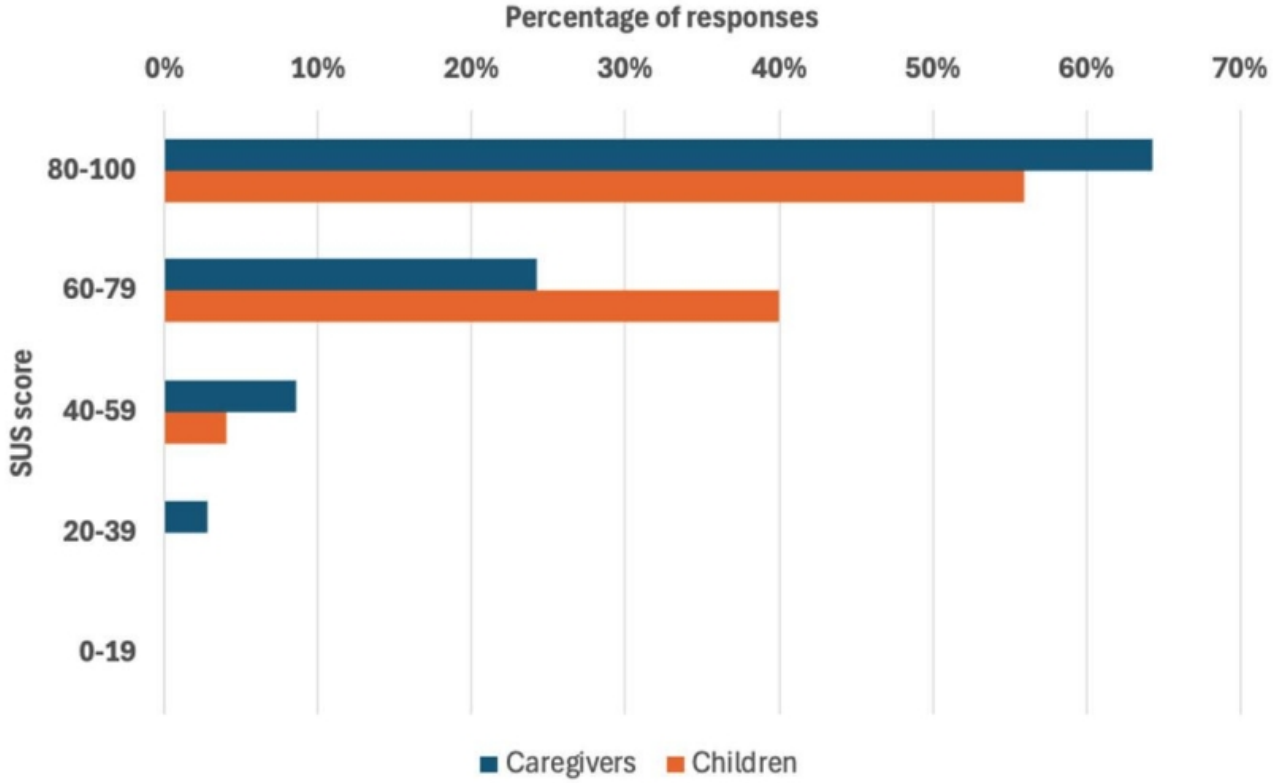

Figure 1. Bar chart showing the distribution of caregiver and child SUS scores. [Score ranges from 0-100, with population benchmark mean of 68 with a score >80 indicating excellent usability (Sauro:2016)]

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