MB-P12 MEDICINSKA SREDSTVA NASPRAM REKREATIVNIH UREĐAJA: ANALIZA MERENJA SRČANE FREKVENCE I OKSIGENACIJE KRVI

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Sve šira primena nosivih rekreativnih uređaja za praćenje zdravstvenih parametara nameće potrebu za procenom njihove tačnosti u odnosu na uređaje koji imaju sertifikat medicinskog sredstva. Cilj ovog istraživanja bio je da se utvrdi da li postoje statistički značajna odstupanja u merenju srčane frekvence i zasićenosti krvi kiseonikom (SpO_2) između rekreativnih uređaja i referentnog pulsnog oksimetra registrovanog kao medicinsko sredstvo.

Sprovedeno je komparativno istraživanje na 30 dobrovoljaca starijih od 18 godina. Kao referentni uređaj korišćen je pulsni oksimetar MD300C29, dok su ispitivani Garmin Forerunner 55, Samsung Galaxy Fit 3 i Xiaomi Smart Band 9. Srčana frekvenca merena je kod sva tri rekreativna uređaja, a SpO_2 kod Samsung i Xiaomi uređaja. Podaci su obrađeni primenom odgovarajućih statističkih testova, korelacione analize i Bland–Altman metode.

Nije utvrđena statistički značajna razlika u merenju srčane frekvence između rekreativnih uređaja i referentnog pulsnog oksimetra, uz veoma visoke koeficijente korelacije i male srednje apsolutne greške. Nasuprot tome, merenja SpO_2 pokazala su značajna odstupanja u odnosu na referentni uređaj, pri čemu su rekreativni uređaji često prikazivali niže vrednosti zasićenosti kiseonikom.

Rekreativni uređaji mogu se smatrati pouzdanim alatima za praćenje trendova srčane frekvence u uslovima mirovanja, dok rezultate merenja SpO_2 treba tumačiti sa oprezom. Ovi uređaji ne mogu zameniti medicinska sredstva u kliničkoj proceni zdravstvenog stanja.

MB-P12 MEDICAL DEVICES VERSUS CONSUMER WEARABLE DEVICES: ANALYSIS OF HEART RATE AND BLOOD OXYGEN SATURATION MEASUREMENTS

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The widespread use of wearable consumer devices for health monitoring has increased the need to evaluate their accuracy compared with certified medical devices. The aim of this study was to determine whether statistically significant differences exist in heart rate and blood oxygen saturation (SpO_2) measurements obtained using consumer wearable devices compared with a medical-grade pulse oximeter.

A comparative study was conducted on 30 volunteers aged over 18 years. The MD300C29 pulse oximeter was used as the reference medical device, while Garmin Forerunner 55, Samsung Galaxy Fit 3, and Xiaomi Smart Band 9 were evaluated as consumer devices. Heart rate was measured using all three wearable devices, whereas SpO_2 measurements were assessed using Samsung and Xiaomi devices. Data were analyzed using appropriate statistical tests, correlation analysis, and Bland–Altman methodology.

No statistically significant differences were observed between wearable devices and the reference pulse oximeter regarding heart rate measurements. High correlation coefficients and low mean absolute errors indicated good agreement. In contrast, SpO_2 measurements demonstrated significant discrepancies compared with the reference device, with wearable devices frequently reporting lower oxygen saturation values.

Consumer wearable devices may be considered reliable tools for monitoring heart rate trends under resting conditions; however, SpO_2 measurements should be interpreted with caution. These devices cannot replace certified medical devices in clinical decision-making or health assessment.

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