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## **The use of new technologies to control body weight and monitor the level of physical activity among adults in Poland**

### **Abstract**

**Introduction:** Civilization diseases, also called lifestyle-related diseases, are a group of chronic non-communicable diseases responsible for over 80% of premature deaths in the world. Diet and level of physical activity are important risk factors for lifestyle-related diseases. It is estimated that only every third of Polish citizens undertake physical activity in line with the recommendations of the World Health Organization. Moreover, the level of nutrition knowledge of Polish citizens has not been sufficiently researched. In recent years, mobile health technologies have gained high popularity (mHealth), such as mobile applications, internet technologies, telecommunications services, and wearables. It is believed that the widespread implementation of digital technologies in public health can improve the proportion of people adhering to the principles of a healthy lifestyle.

**Objective:** The main objective of the study was to assess the level of use of new technologies to control body weight and monitor the level of physical activity among adult Polish residents, and to identify potential barriers to the use of new technologies supporting healthy lifestyle choices.

**Material and methods:** This study was carried out in a cross-sectional study model. The research tool was an original research questionnaire containing 20 questions on the use of new technologies to control body weight and monitor the level of physical activity, diet-related diseases and risk factors related to the diet; nutritional knowledge; eating habits; lifestyle. The questionnaire survey was carried out on 1-4 July 2022 on a nationwide sample of 1,070 adult residents of Poland aged 18-89. The non-probability quota sampling was used. Data was collected using the computer-assisted web interview (CAWI) method.

**Results:** Data were obtained from 1070 respondents (52.6% were women), and the mean age of the respondents was  $45.1 \pm 16.1$  years. Among the respondents, 43.4% had higher education, every third of respondents lived in rural areas, and 45% declared that they had been diagnosed

with at least one chronic disease. Almost a quarter of respondents (23.2%) used wearable devices (a wristband or a watch) to monitor their level of physical activity, and 14.4% had a smart bathroom scale at home. Among the respondents, 16.3% declared using mobile applications to monitor physical activity levels, and 13.3% used the mobile application to control their diet and body weight. Among 19 different socioeconomic and lifestyle factors analyzed using logistic regression models, younger age, diet, regular physical activity and participation in organized sports activities were the most important factors significantly ( $p < 0.05$ ) related to the use of mobile applications and wearables for weight control and monitoring of physical activity levels. Of the eight diet-related diseases analyzed in the study, overweight/obesity was the most frequently reported diet-related disease by respondents (85.0%), and 74% of respondents were aware that an unhealthy diet can lead to the development of diabetes. Of the eight diet-related risk factors included in this study, excessive sugar and salt consumption (73.4%) was the most commonly reported diet-related risk factor. Of the 11 different socioeconomic factors considered in the analysis, having a university degree and the presence of chronic diseases were the most important factors associated with a higher level of awareness of diet-related diseases and diet-related risk factors ( $p < 0.05$ ). Most of the respondents (52.6%) declared a moderate level of nutritional knowledge. The most frequently declared source of nutritional knowledge was Internet information services (41.8%). Half of the respondents (50.3%) declared that they had checked the information on the packaging within the last 30 days on the calorific value and nutritional value of meals or food products purchased in a store, and 15.4% of respondents admitted that during the last visit to a fast-food bar or restaurant, they checked the calorific value and nutritional value of meals. Female gender ( $p < 0.001$ ), having higher education ( $p = 0.002$ ), presence of chronic diseases ( $p < 0.001$ ), regular physical activity ( $p < 0.05$ ), not smoking ( $p = 0.03$ ) were significantly associated with checking food labels and the nutritional value of meals.

**Conclusions:** The obtained results indicate a low level of knowledge about diet-related diseases and risk factors associated with diet among adult Polish residents. It has been observed that most adults in Poland do not use scientifically verified sources of knowledge about nutrition, such as nutritional consultations with a doctor or dietitian. Significant age barriers were observed in the use of new technologies to control body weight and monitor the level of physical activity among adult residents of Poland. The use of mobile applications and wearables was associated with lifestyle factors such as diet, regular weight control, and levels of physical activity. No socio-economic barriers were observed in access to mobile applications and

wearable devices. The lack of differences in terms of sex, place of residence, and level of education suggests that the widespread use of new technologies supporting pro-health behaviors may contribute to reducing health inequalities, which are one of the major challenges of the Polish health care system.