

**Andrej MIKLOSIK¹, Peter STARCHON*²,
Lucia KOCISOVA³, Milos HITKA⁴**

ANTHROPOMETRIC DATA IMPORTANCE IN FURNITURE DESIGN AND MARKETING

SUMMARY

Furniture design and marketing needs to reflect the increasing anthropometric data of population in industrialised countries. With beds and mattresses, the need to accommodate users with higher than standard weight and height is even more apparent as they directly affect quality of sleep and life. In Slovakia, the weight of approximately 46,000 men with severe obesity is more than 110 kg, however the European standards only assess the strength, durability, and safety beds based on use by persons weighing up to 110 kgs. The aim of the research presented in this article was to determine whether it is possible to find and acquire an appropriate mattress for overweight and/or extra tall Slovak consumers. We examined the product portfolios of 30 mattress retailers in Slovakia to determine if they reflect the needs of the current population and contain suitable products for heavier and taller people. The method of content analysis was used, with data collected, coded, and statistically processed in July 2022. The results revealed that 87% of Slovak retailers offer mattresses for heavier people above 110 kg and 30% of retailers for extra tall consumers. Detailed results reveal the options for people with weights up to 200 kg and evaluate the comfort of finding an appropriate product for such consumers.

Keywords: anthropometric data, furniture marketing, mattress portfolio, mattresses for overweight people, mattresses for extra tall people

INTRODUCTION

The population's anthropometric features are changing. The average height and weight of both women and men are increasing over time (Sedmák and

¹ Andrej Miklosik: Comenius University in Bratislava, Faculty of Management, Department of Marketing, Odbojarov 10, 820 05 Bratislava, SLOVAKIA

² Peter Starchon* (Corresponding author: starchon1@uniba.sk): Comenius University in Bratislava, Faculty of Management, Department of Marketing, Odbojarov 10, 820 05 Bratislava, SLOVAKIA

³ Lucia Kocisova: Comenius University in Bratislava, Faculty of Management, Department of Marketing, Odbojarov 10, 820 05 Bratislava, SLOVAKIA

⁴ Milos Hitka: Technical University in Zvolen, Faculty of Wood Sciences and Technology, 960 01 Zvolen, SLOVAKIA

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Hitka, 2004). Such trends have been observed and confirmed in multiple countries. In fact, over the past 1.5 centuries, the average height of people in industrialised nations has increased by approximately 10 cm (Scientific American, 1988). Hauspie *et al.* (1997) identified increases of 30 mm/decade in some countries of Southern and Eastern Europe over the last decades of the 20th century. Today's taller stature has been attributed mostly to improved socioeconomic conditions (Styne and McHenry, 1993).

The average weight of individuals is on the rise as well. Researchers are attributing the increasing percentage of overweight people to lifestyle, eating behaviour, and stress (Hruby and Hu, 2015; Sominsky and Spencer, 2014). Since 1975, worldwide obesity has almost tripled (World Health Organization, 2021). In 2017, nearly a third of the world's population was overweight or obese, with the number of obese people doubling since 1980 (Fox, 2017). In eight countries (U.S., Egypt, Turkey, Chile, Argentina, Mexico, UK, and Iraq), the female age-standardised obesity has climbed over 30% (World Economic Forum, 2016). In Slovakia, the situation is similar to other developed countries. Following the BMI data, 400,000 men in Slovakia suffered from obesity and 90,000 suffered from severe obesity in 2017 and the weight of approximately 46,000 men with severe obesity was more than 110 kg (Réh *et al.*, 2019).

Such increases in height and weight need to be reflected in furniture design (Langová *et al.*, 2019; Mokdad and Al-Ansari, 2009). Furniture needs to be made bigger and more durable. In recent years, there has been intensive research on secular population trends in Slovakia. At the same time, current standards for the dimensions and strength characteristics of seating and bed furniture are being analysed (Hitka *et al.*, 2018). Furthermore, material needs to be addressed in relation to strength characteristics (Pedzik *et al.*, 2020, Kwidziński *et al.*, 2021, Seng Hua *et al.*, 2022, Vilkovska *et al.*, 2018, Gejdos and Potkany, 2017). Requirements for the sizes and load-bearing capacity of furniture determined for the current population exceed the European standardised sizes. The valid European standard EN 12520:2015 assesses the strength, durability, and safety of domestic seating furniture e.g. chairs or sofas, based on use by persons weighing up to 110 kg (Furnitest, 2022). Bed testing according to EN 1725:1998 is also performed based on the nominal weight of 110 kg (European Standards, 2022). Despite the outdated standardisation beds and mattresses need to accommodate taller and heavier people than ever before.

This article focuses on the marketing perspective of this problem. It has been determined that overweight users are not taken into consideration in the process of designing and making furniture construction in Slovakia (Réh *et al.*, 2019). With beds and mattresses, the implications are broader than pure furniture durability as they affect sleep quality and subsequently quality of life (Zhang *et al.*, 2021). Therefore, the aim of the research presented in this article was to determine whether for such Slovak consumers it is possible to easily find and acquire an appropriate mattress. We examined the product portfolios of mattress retailers in Slovakia to determine if they reflect the needs of the current

population and contain suitable products for taller and heavier people. We also looked at how the information regarding mattress length and weight is presented and whether it is possible and easy to find and purchase such mattresses online.

MATERIAL AND METHODS

To assist in achieving the main objective of the paper, these research questions were defined:

RQ1: Do Slovak retailers offer mattresses for heavier people above 110 kgs?

RQ2: Do Slovak retailers offer mattresses for extra tall people?

RQ3: How easy/difficult is it for Slovak consumers to find such products online?

To provide answers to the research questions, an empirical study has been conducted using the content analysis method. Websites of 30 mattress retailers operating in Slovakia were analysed between 05 and 19 July 2022. The most prominent retailers were included in the research sample and were identified by searching in Google.sk for terms such as ‘mattress’, ‘mattresses’ or ‘mattress retailer’ in their Slovak language equivalent. The results on the first 5 pages were scanned and analysed and a list of online mattress retailers was created, containing the brand name and website address (URL).

By analysing the online content on these websites, certain parameters and content were observed and marked into a respective category in a spreadsheet. These parameters included: i) Menu – weight (are there certain weight categories presented in the mattress menu); ii) Menu – length (are there certain length options/categories presented in the mattress menu); iii) Firmness filter (is there an option to filter out mattresses based on their level of firmness); iv) Weight filter (is there an option to filter out mattresses based on the user weight); Length filter (is there an option to filter out mattresses based on their length); v) Weight information (does the website offer information on the maximum weight limit for the mattresses sold); iv) Portfolio details (does the website sell mattresses with higher weight limits above 110 kg and larger mattresses with more than 200 cm length).

All authors participated in defining the parameters and their thresholds. The answers were coded into the spreadsheet by the first author and checked/verified by the second author. The data was processed using descriptive statistics. Patterns were identified and the results were used to provide answers to the defined research questions.

RESULTS AND DISCUSSION

For people looking to buy a mattress in Slovakia, there is plethora of options available online. There are dozens of retailers offering mattresses from local and foreign manufacturers. For a consumer of a standard height and weight, it is very easy to order and select a mattress. However, how does the situation look like if a person of non-standard height and weight needs to purchase a mattress? Are such products available?

When it comes to selecting a mattress for a person with higher than the standard weight of 110 kg, it is of utmost importance that the retailers display the information on maximum recommended weight for each of their mattresses. Otherwise, their customers won't be able to determine which mattress suits their weight. Out of the 30 retailers, 24 (80%) displayed the information about the recommended user weight by each mattress. One retailer had this information shown by some mattresses only. 17% of retailers did not display any information about the appropriateness of their products for users of different weights.

Next, we evaluated the choice of mattresses for people of higher weight. We examined the portfolio of each retailer and detected whether they have mattresses on offer that would suit a person with the weight of 120 kg, 130 kg, 140 kg and so on. The results are displayed in Figure 1. As it can be seen, 87% of retailers offer at least one option for users weighing 120 kg. Customers weighing 130 kg still have a good choice in terms of point of sale, with 83% of retailers having a mattress suiting their weight. Mattresses for customers with 140 kg can be found at 73% of retailers and for 150 kg customers at 67% of retailers. However, when it comes to even heavier people, the offer gets significantly reduced with only 30% retailers offering a product for users weighing 160 kg. The highest weight recommended for a mattress user was 200 kg and such products are on offer by 10% of retailers.

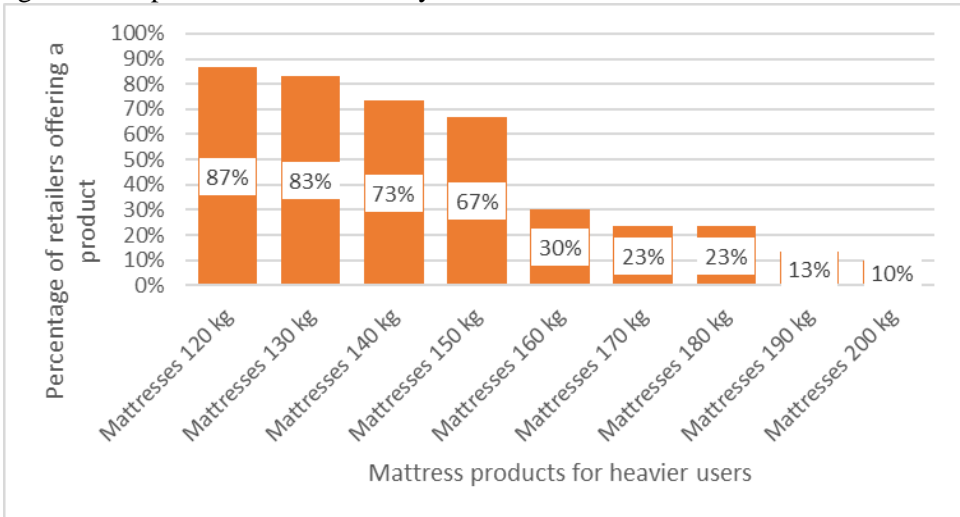


Figure 1. Availability of mattresses for heavier users

Most retailers (70%) only offer mattresses of standard length 200 cm. For taller people this does not need to be sufficient. Nine retailers (30%) have a mattress for extra tall people on offer. In case of one retailer (3.33%) the length was set to 210 cm, by three retailers (10%) this was 220 cm, and five retailers (16.7%) offered mattresses of custom lengths (and width) that can be manufactured as per the customer requirements. Results are depicted in Figure 2.

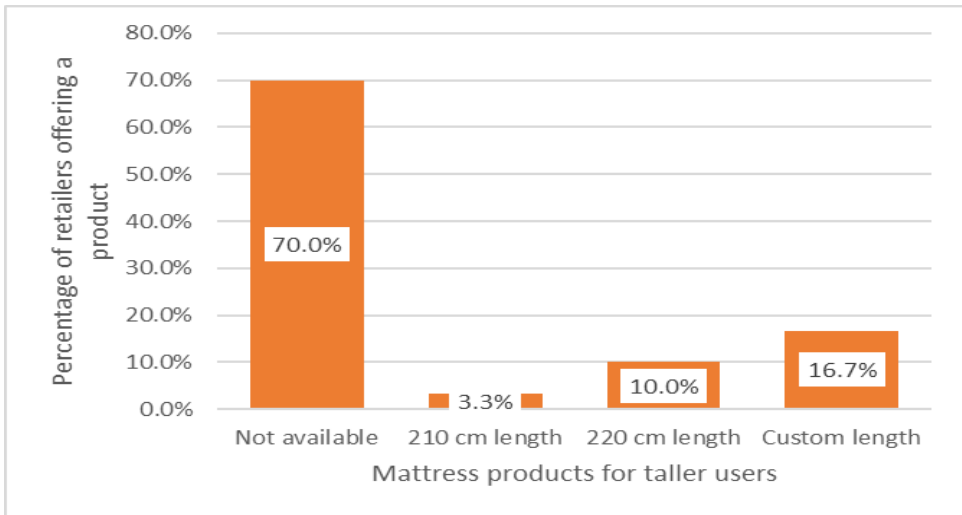


Figure 2. Availability of mattresses for taller users

When it comes to the filtering process, most retailers (60%) offer a firmness filter that allows the user to choose from predefined firmness levels. Sometimes, it's only three levels – soft, medium, and firm, however, some retailers include up to five levels of firmness in their filtering options. A similar situation was observed when it comes down to choosing a mattress based on its length, where 57% of retailers offered an option that would enable to activate a filter based on mattress size. Only 27% of retailers offered a filter setting that would display mattresses by the recommended weight of a user. Some retailers had these options in their mattress menu, too but it was a minority (10% for weight options and 17% for size options). Details are shown in Figure 3.

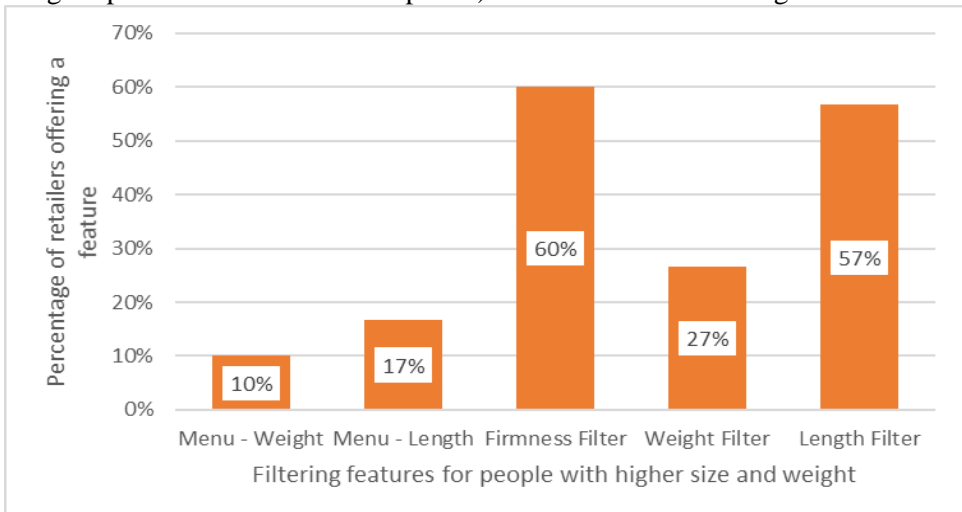


Figure 3. Options and settings of retailers' websites for filtering mattresses by parameters

In the following part, research questions defined above will be answered. The first research question (RQ1) was: Do Slovak retailers offer mattresses for heavier people above 110 kgs? The analysis has revealed that not although not every retailer offers mattresses for heavier people, the offer is quite rich. For example, 83% of the examined retailers offer an appropriate mattress for users weighing 130 kg. The choice however gets more limited with increasing user weight and gets quite limited with weight over 160 kg. There are, however, some options even for customers weighing 200 kg.

The second research question (RQ2) was: Do Slovak retailers offer mattresses for extra tall people? Unlike by heavier people, the research has revealed that the options here are quite limited. 70% of retailers only offer mattress with a standard height 200 cm. There are, however, options for taller people, with some retailers stocking mattresses 210 cm and 220 cm height and others offering custom tailored mattresses manufactured according to specific requirements.

Lastly, how easy/difficult is it for Slovak consumers to find such products online? (RQ 3). Based on the data presented in Figure 3 we can confirm that it can be quite challenging for people with non-standard weight and height to find an appropriate mattress. Most of the retailers do not offer filtering options based on the recommended weight of mattress user and therefore, the customer often needs to manually check every single product available and hope that at least on the product detailed page, such information will be displayed.

CONCLUSIONS

The following recommendations to retailers can be made in regards to their marketing, superficially, product portfolio and the way they present it online on their websites: i) Consider the basic anthropometric information of their customers – height and weight – and display this information by every product; ii) Consider adding more products into the mattress portfolio that would be suitable for taller people and overweight people; iii) Work on the user experience when looking for such products to shorten the selection process by enabling filters based on the height of the mattress and maximum recommended user weight.

This research has certain limitations that can also represent ideas for future research: i) The research has specifically focused on mattresses, however, other products such as beds, sofas or chairs also need to reflect changing anthropometric data of the population and could be subject to a similar analysis; ii) Only retailers from Slovakia were included in the research sample – if other countries are included, a comparative analysis could reveal interesting findings.

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