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DESIGN FOR PEOPLE WITH DISABLED HEALTH OPPORTUNITIES (ON THE EXAMPLE OF BLIND AND WEAK PEOPLE)

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ABSTRACT

Disability is an emerging field within public health; people with significant disabilities account for more than 15% of the world population. People with disabilities who receive a high-quality education and enter the workforce prepared are not only a benefit to themselves, but to their families, employers, and communities. Disparity status for this group would allow federal and state governments to actively work to reduce inequities. In this article, the application of the basic principles of universal design on the example of creating relief-graphic aids for blind and visually impaired people is considered. We developed a methodology for this purposed which results demonstrates its accuracy and efficiency.

1. INTRODUCTION

The concept of "universal design" is based on the idea of convenience and comfort for everyone. According to experts, universal design is important for people with disabilities (10% of the total population), necessary for people with limited mobility (40%) and convenient for everyone (100%) [1, 2]. Universal design is the design of objects, space, programs, and services that help maximize the use of space and the objects in it to various categories of people. But in this case, the moment of using specialized devices for various limited mobility groups is not excluded. The creation and maintenance of a barrier-free living environment includes:

- unhindered access to objects of social infrastructure;
- use of transport and transport communications;
- access to media;
- obtaining social services;
- the creation of a "barrier-free" psychological environment in society[1, 3].

The implementation of the state program "Accessible Environment" is currently extended until

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2020 (order No. 2736-p, dated October 27, 2014). Currently, designers and architects create objects that match to needs of different groups of people. Design solutions help to increase the overall level of comfort for all people. The creation of an accessible environment is the basic principle of universal design. Consider the basic principles of universal design for the design of elements of an accessible environment for the visually impaired [4].

It is known that the visually impaired are divided into two categories with differing needs: people who do not see at all (blind) and with residual vision (visually impaired). Visually disabled people make up approximately 4% of the total number of people with disabilities, including completely blind people - less than 1% [5]. Race/ethnicity, age, language, sex or gender, poverty, and low education can compound the impact of disability, leading to even poorer health and quality of life [6, 7].

For blind and visually impaired citizens, a "barrier-free" environment is not only special means of social and environmental adaptation but well-known adaptations necessary for all categories of the population (curbs, sidewalks, stairs, handrails). Tactile informational resources are all surfaces that inform a blind person about the location, purpose of a certain object, warn about the dangers and direct the blind in the right direction, as well as means involved in the spiritual, aesthetic and educational activities of a blind person.

2. METHODOLOGY

Relief is a form that by plastic modeling on the surface visually depicts a three-dimensional object. There are apply three types of relief drawings for the visually impaired.

- -contour drawings;
- -application (silhouette) drawings (this type of drawing is usually carried out in the form of a silhouette cut out of thick paper and glued onto a paper sheet or tablet);
- -bath-relief drawings convey the shape of the object. They are made of gypsum, metal, followed by printing under press on punched card paper or plastic [8].

The spreading of the relief is largely dependent on the ratio of height and surface size of the relief. With the help of tactile sensations, the texture of objects is known, it means the properties of their surface. These properties can cause aesthetic sensations, perceived by the tips of the fingers. Tactile informing surfaces should be safe [7].

Note that blind and visually impaired people perceive a graphic pattern differently. First along the contour, and then the remaining elements, and only then a complete picture of the whole image is formed. This should be taken into account when creating graphic images intended for blind people. Simplified a lot of number of small parts. The image should be clear and concise. In the conditions of the "Lipetsk Regional Special Library for the Blind", relief-graphic aids for the blind and visually impaired people were designed and created. This process was carried out using modern technologies and included the following steps:

- analysis of the model;
- creating a sketch of the object;
- scanning and processing a sketch;

- print on the heater "Tiger" (France) on special paper "ZY-TEX SwellPaper", intended for tactile perception.

The device allows you to create relief images. With the help of heat, the graphic pattern on special paper becomes voluminous, which makes information accessible to the visually impaired. Creating a relief-graphic images begins with the study, analysis, selection of the angle mode, and then converting the objects of the original image. It is necessary to simplify a large number of lines and elements. Therefore, when converting objects, it is necessary to graphically transfer the characteristic features of the form. Correctly determine the size and proportionality of the object and its parts. The image should be clear.

3. RESULTS

Taking into account all the scientifically-based principles of ergonomics and aesthetics, we have developed and manufactured unique didactic aids for the blind and visually impaired. The process of design and manufacturing of the product was carried out taking into account the optimality of its functional, operational qualities. The publication "In the memory of the people for centuries ...", fig. 1 (monuments of the Great Patriotic War in Lipetsk), created thanks to the implementation of the municipal social grant in the framework of the city program "Lipetsk - our common home".

Figure 1: Cover of the publication for the visually impaired "In the memory of the people for centuries" [3].

Training can be improved at several levels: (1) basic disability awareness for all public health workers and clinical care providers, (2) discipline-specific training on select aspects of disability, and (3) a needed infrastructure for core leadership training of health professionals in disabilities that addresses the full life span. Table 1 presents the Population Differences between People with and

Without Disabilities on Health Indicators of Health Care Access, Health Behaviors, Health Status, and Social Determinants of Health.

Table 1: Population differences between people with and without disabilities on health indicators of health care access, health behaviors, health status, and social determinants of health: United States

Health Indicator	People With Disabilities (%)	People Without Disabilities (%)	Data Source
Health care access			
In past year, needed to see doctor but did not because of cost[a]	27.0	12.1	BRFSS 2010
Women current with mammogram[a]	70.7	76.6	BRFSS 2010
Women current with Pap test[a]	78.3	82.3	BRFSS 2010
Health Behaviors			
Adults who engage in no leisure-time physical activity[a]	54.2	32.2	NHIS 2008
Children and adolescents considered obese (aged 2–17 y)[b]	21.1	15.2	NHANES 1999–2010
Adults who are obese[a,b]	44.6	34.2	NHANES 2009–2010
Adults who smoke (100 cigarettes in lifetime and currently smoke)[a]	28.8	18.0	NHIS 2010
Annual no. of new cases of diagnosed diabetes (per 1000 persons)[a]	19.1	6.8	NHIS 2008–2010
Adults with cardiovascular disease			NHIS 2009–2011
18–44 y	12.4	3.4	
45–64 y	27.7	9.7	
Victim of violent crime (per 1000 persons)[a]	32.4	21.3	NCVS 2007
Adults reporting sufficient social and emotional support[a]	70.0	83.1	BRFSS 2010
Social determinants of health			
Adult (> 16 y) unemployment	15.0	8.7	CPS 2011
Adult (> 16 y) employment	17.8	63.6	CPS 2011
Adults with < high school education	13	9.5	BRFSS 2010
Internet access	54	85	NOD 2010
Household income < $15 000	34	15	NOD 2010
Inadequate transportation	34	16	NOD 2010

In addition, the design of relief-graphic images of the following manuals for the blind and visually impaired has been developed: “The streets of the city named their names”, “The estates of the Lipetsk region”; "Temples and monasteries of the Lipetsk and Yelets eparchy." In order to familiarize themselves with the art crafts of the Lipetsk region, “The Magic Power of the Romanov Toy” illustrations of the relief-graphic manual were developed.

4. CONCLUSION

Relief-graphic illustrations for the blind and visually impaired. This manual is very popular among the visually impaired, as it allows you to explore the features of the traditional folk crafts of the Lipetsk region. On the basis of the received artistic images, the visually impaired can make a traditional Ramon's toy. In accordance with the modern requirements of education, relief publications

for the blind and visually impaired acquire the status of a necessary condition for the organization of training for disabled people. An important role here is ergodizayn.

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