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Application of Clinical Ergonomics in Centres for People with Special Needs from the Perspective of Psychologists

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Abstract
The present study aimed to determine whether there are statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists, attributable to the nature of the institution. A descriptive methodology was employed. The study sample consisted of 62 clinical psychologists working in various governmental sectors, selected through convenience sampling. The researchers developed a scale to measure the application of clinical ergonomics dimensions in

centres for people with special needs, which was validated psychometrically prior to use. Following statistical analysis of the data using SPSS version 22, the study reached the following results: the application of clinical ergonomics dimensions in centres for people with special needs is available from the perspective of clinical psychologists, particularly in the dimensions of physical conditions and the design and organisation of the workplace. Furthermore, there are no statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution.

Keywords: *clinical ergonomics, people with special needs, clinical psychologist*

Application de l'ergonomie clinique dans les centres pour personnes ayant des besoins spéciaux du point de vue des psychologues

Résumé
La présente étude visait à déterminer s'il existe des différences statistiquement significatives dans l'application des dimensions de l'ergonomie clinique dans les centres pour personnes ayant des besoins spéciaux du point de vue des psychologues cliniciens, attribuables à la nature de l'institution. Une méthodologie descriptive a été employée. L'échantillon de l'étude était composé de 62 psychologues cliniciens travaillant dans divers secteurs gouvernementaux, sélectionnés par échantillonnage de commodité. Les chercheurs ont mis au point une échelle pour mesurer l'application des dimensions de l'ergonomie clinique dans les centres pour personnes ayant des besoins spéciaux, qui a été validée psychométriquement avant d'être utilisée. Après analyse statistique des données à l'aide du logiciel SPSS version 22, l'étude a abouti aux résultats suivants : l'application des dimensions de l'ergonomie clinique dans les centres pour personnes ayant des besoins spéciaux est possible du point de vue des psychologues cliniciens, en particulier dans les dimensions des conditions physiques et de la conception et de l'organisation du lieu de travail. En outre, il n'existe pas de différences statistiquement significatives dans l'application des dimensions de l'ergonomie clinique dans les centres pour personnes ayant des besoins spéciaux du point de vue des psychologues cliniciens, attribuables à la nature de l'institution.

Mots-clés : *ergonomie clinique, personnes ayant des besoins spéciaux, psychologue clinicien*

Introduction

The care and integration of individuals with special needs represent a significant indicator of societal progress and the advancement of psychological, health, and social services (Sakina &Wahda, 2022). Globally, over 500 million people live with disabilities, with a majority residing in developing countries (United Nations, 2002). In Algeria, the prevalence of conditions such as autism spectrum disorder has notably increased in recent years (Hartani & Benhalilem, 2025). Addressing this population's needs requires medical and social support and a conducive environment that facilitates psychological rehabilitation and social integration (Ahmed, 2016; Ben Dar, 2022). Clinical psychologists play a critical role in this process by providing targeted psychological care aimed at mitigating the emotional and behavioural challenges associated with disabilities (Imran & Imran, 2023). To enhance the efficacy of such care, the application of clinical ergonomicswhich involves optimizing physical and psychological work conditions and the design of workplaceshas gained importance (Bouhara &El Ouadi, n.d.; Saadi, 2011). Despite the growing recognition of ergonomics in institutions serving people with special needs, challenges remain in fully implementing standards that support practitioners and clients (Al-Hajj, 2015; Hassan et al., 2003). This study investigates how clinical ergonomics dimensions are applied in centres for people with special needs from the perspective of clinical psychologists, thereby improving the quality of psychological services and work environments in these institutions.

Problem Statement

The care for individuals with special needs in contemporary societies is considered a key indicator of societal progress and a clear reflection of advancements in psychological, health, and social care. This focus has arisen due to the increasing number of individuals with disabilities. According to United Nations statistics from 2002, there are more than 500 million people with disabilities worldwide, with 85% residing in developing countries. Furthermore, United Nations data from 2007 revealed that mentally disabled individuals alone constitute 10% of the total global population (Sakina &Wahda, 2022, p. 461). At the Arab regional level, the number of persons with disabilities reached 29.2 million of the total population (Hawas, 2019, p. 167).

The number of children diagnosed with autism spectrum disorder alone in Algeria was 39,000 in 2009, rising to 65,000 in 2010 and reaching 80,000 cases by 2013 (Hartani & Benhalilem, 2025, p. 59).

The issue of disability has become one of rights and duties, as prescribed by religions, endorsed by international organisations, and enshrined in national constitutions. Attention is not limited to the services provided to this group. However, it extends to their integration and addressing their humanitarian needs, psychological, health, social, educational, and cultural challenges, as well as how to harness their potential (Ahmed, 2016). It involves utilising their skills without viewing them through the lens of deficiency and providing opportunities to enjoy the available prospects in society (Ben Dar, 2022). Therefore, social policy has aimed at qualitative care by establishing specialised institutions (psycho-pedagogical centres) and providing the necessary educational resources to rehabilitate them according to a scientific methodology that responds to the requirements of the

child with disabilities through continuous follow-up. Early educational care must be ensured for them regardless of the duration of schooling or age, as long as the condition of the person with a disability justifies it (Berhail & Atiq, 2022).

This can only be achieved through the supervision of a specialised team, in which the clinical psychologist plays a fundamental and pivotal role in psychological care that aims to reduce the severity of psychological, emotional, and behavioural disorders resulting from their disability (such as depression, pathological fears, feelings of sadness, mood swings, feelings of helplessness and low self-worth, loneliness and dependency, distorted self-image, self-directed and other-directed aggression, stubbornness, temper tantrums, social withdrawal, stereotypical and maladaptive behaviours). Moreover, psychological care seeks to enable individuals with disabilities to become self-aware, capable of communicating with others, independent, and possess cognitive, motor, and emotional abilities that allow social integration. Psychological care has been defined as "a corrective function that seeks to modify behaviour according to standards; it is a process of understanding the individual's potentials and preparedness and utilising them to solve their problems, developing life plans through an understanding of their reality and present circumstances, and assisting them in achieving the greatest possible happiness and competence, as well as self-actualisation leading to a state of harmony" (Imran & Imran, 2023, p. 373).

However, the process of psychological care and rehabilitation, in particular, requires institutions and centres that meet structural, health, aesthetic, design, and equipment standards, which facilitate the work of the clinical psychologist by creating a suitable environment imbued with practi-

cal and aesthetic values that correspond to the psychological needs of the individual (Abdelmonem, 2020). Not to be overlooked is the role played by the institutional environment in shaping the personality of the child with disabilities and fostering their development to adapt to the social milieu (Rahis, 2024).

This concept is referred to as **ergonomics (Ergonomie)**, originally a Greek term with ancient historical roots; however, the term only emerged in the mid-20th century. With the establishment of the Society for Ergonomics Research in Britain in 1949, ergonomics or human engineering became an independent scientific discipline. Based on the goals of this society, ergonomics can be defined as the scientific study of the relationship between humans and their work environment. The work environment encompasses the individual's conditions, including the machines and tools used, work methods, and organisation, whether collective or individual. All these factors relate to human nature, capabilities, inclinations, and preparedness (Bouhara & El Ouadi, n.d., p. 149).

The International Ergonomics Association (IEA) defines ergonomics as "taking into account all the physiological and systemic characteristics of humans for the design and modification of work tools and their environment, or for the adjustment of the work itself" (Saadi, 2011, p. 1). Although the field of people with special needs is among the most prominent areas in which ergonomics studies have emerged, due to the urgent need to adapt environments to the specificities of individuals with special needs, as demonstrated in the presentation by researcher Jamila (2014) on the role of ergonomics in improving the home environment for persons with motor disabilities (Jamila, 2014).

Moreover, the study by Hassan et al. (2003) aimed to assess the adequacy of the facilities in buildings of schools for persons with disabilities in achieving the objectives of special education in Egypt. The study found that only 38.2% of the schools met the requirements for size and organisation, with art rooms, physical education rooms, and physiotherapy rooms present in only 12%. Furthermore, 46% of the schools had a school theatre, but where available, most of the equipment was lacking. The study also highlighted deficiencies in resource rooms and unique resource rooms for the visually impaired and intellectually disabled (Hassan et al., 2003).

Despite the efforts to improve the level of services provided to this group, they remain insufficient. This was evidenced by the results of Al-Hajj's (2015) study, which found that people with special needs in Algeria hold negative attitudes towards ergonomics applications designed for them, negatively affecting their psychological security and willingness to participate in daily life across different environments (Al-Hajj, 2015).

The present study seeks to determine the extent of the application of clinical ergonomics in centres for people with special needs from the perspective of clinical psychologists, who represent a fundamental element in the psychological care process for this group. Within the researchers' scope, this is addressed by answering the following research questions:

- To what extent are the dimensions of clinical ergonomics applied in centres for people with special needs from the perspective of clinical psychologists?
- Are there statistically significant differences in the application of clinical ergonomics dimensions in cen-

tres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution?

Study Hypotheses

- From the perspective of clinical psychologists, there are statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs, which are attributable to the institution's nature.

3. Study Objectives

- To determine whether there are statistically significant differences between the theoretical and the assumed mean in applying clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists.
- To identify whether there are statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution.

Significance of the Study

The significance of the population complements the importance of this topic studiedpeople with special needsa group with distinct characteristics and requirements in society. Therefore, it is fundamental to determine whether these needs are met by standards agreed upon by those responsible for their care. This is especially relevant to the clinical psychologist, who plays an important role in rehabilitation and psychological care, aiming to help individuals adapt to their surroundings, increase their self-awareness, and achieve relative stability. It also involves utilising their intel-

lectual, motor, and emotional abilities to enable their integration into society.

1. Operational Definitions of Study Concepts:

- **Clinical Ergonomics:** A type of ergonomics achieved through the availability of physical conditions, psychological work characteristics, and the design and organisation of the workplace. The present study is represented by the total scores obtained from the questionnaire measuring the application of clinical ergonomics developed by the researchers.
- **Centres for People with Special Needs:** Institutions of an administrative and service nature, where medical, psychological, and social care is provided to individuals with special needs by a specialised team aiming to achieve their social and professional integration.

2. Field Research Procedures

2.1 Research Methodology:

The researchers employed the descriptive method due to its suitability for the study.

2.2 Study Instrument:

After reviewing previous studies related to the topic and within the scope of their knowledge, the researchers found no existing instrument precisely measuring the application of clinical ergonomics in centres for persons with disabilities. This prompted them to design a tool to quantify this variable, following several steps:

1. Reviewing psychological literature, including works by Boutera(2023), Bouzourane Farida (2022), Amer

(2022), Kawja (2022), Azri (2021), Saib (2021), Rahwani (2019), Lamari (2021), Slimani (2017), Tembout (2016), Al-Hajj (2015), Slimani (2014), and Bouhara and Elmin (n.d.).

2. Benefiting from the researchers' field and teaching experience, as well as the internship of psychology and educational sciences students in institutions affiliated with the Directorate of Social Activity.

- **First Dimension: Availability of Physical Conditions at Work**
- Items: 1, 4, 11, 16
- **Second Dimension: Design and Organisation of the Workplace**
- Items: 2, 3, 10, 14, 15, 17, 18
- **Third Dimension: Availability of Psychological Work Characteristics**

Items: 5, 6, 7, 8, 9, 12, 13

2.2.1 Scoring Method:

The responses of the research sample are converted into scores distributed across their answers to the questionnaire items. The scale scores range from a minimum of 18, a midpoint of 36, to a maximum of 54. The respondent answers each item using a self-assessment approach, and the examiner assigns scores as follows:

- For the answer "Agree/Yes," assign a score of 3.
- For the answer "Neutral/Sometimes," assign a score of 2.
- For the answer "Disagree/No," assign a score of 1.

Finally, all item scores are summed to obtain the total score for the scale.

2.2.2 Psychometric Properties of the Clinical Ergonomics Application Questionnaire:

The researchers tested the validity and reliability of the questionnaire using established scientific methods, as detailed below:

A. Validity:

A.1 Content Validity:

The clinical ergonomics application questionnaire, consisting of 18 items, was presented to five expert professors from Sidi Bel Abbes, El Bayadh, and Oran universities. The majority agreed that the items were appropriate for the scale.

A.2 Internal Consistency Validity:

Table 1: Correlation Coefficients Between Each Item and Its Corresponding Dimension and Between Each Item and the Total Score of the Clinical Ergonomics Application Questionnaire

Item	Correlation with Dimension	Correlation with Total Score	Item	Correlation with Dimension	Correlation with Total Score	Item	Correlation with Dimension	Correlation with Total Score
1	0.71**	0.69**	2	0.58**	0.61**	5	0.44**	0.39**
4	0.59**	0.58**	3	0.57**	0.56**	6	0.68**	0.80**
11	0.56**	0.36**	10	0.60**	0.59**	7	0.26	0.29*
16	0.67**	0.48**	14	0.39**	0.28*	8	0.75**	0.67**
			15	0.42**	0.30*	9	0.72**	0.69**
			17	0.64**	0.71**	12	0.57**	0.52*
			18	0.76**	0.52**	13	0.66**	0.61**

Table 1 shows that all correlation coefficients, calculated using Pearson's correlation between each item and its corresponding dimension, were statistically significant, ranging from 0.39 to 0.80 at the 0.01 significance level. The exception was item 7 in the second dimension, which was retained due to its practical significance despite lacking statistical significance.

Besides, all correlation coefficients between each item and the total questionnaire score were significant, ranging from 0.28 to 0.52 at the 0.05 significance level and from 0.36 to 0.69 at the 0.01 significance level.

Furthermore, the correlation coefficients between the dimensions and the total score of the Clinical Ergonomics Application Questionnaire were calculated, with the results presented in the table below.

Table 2 : Correlation Coefficients Between Dimensions and the Overall Questionnaire Score

Dimension	**Correlation Coefficient with Overall Questionnaire**	**Significance Level**
Availability of Physical Conditions in the Workplace	0.91	0.01
Design and Organisation of the Workplace	0.58	0.01
Availability of Psychological Work Characteristics	0.71	0.01

The above table shows that all dimensions are consistent with the overall questionnaire, with correlation coefficients ranging from 0.58 to 0.91 at the 0.01 significance level. This indicates that the scale possesses strong validity coefficients.

B. Reliability:

For greater precision and to further confirm the instrument's suitability, the researchers calculated reliability coefficients using internal consistency (Cronbach's alpha) and split-half methods. The results are as follows:

Table 3: Reliability Coefficients for the Clinical Ergonomics Application Questionnaire

Variables	Cronbach's Alpha Coefficient	Split-Half Correlation Coefficient	Spearman-Brown Correction
Questionnaire	0.85	0.65	0.78

The results of the above table indicate that the questionnaire's reliability coefficients ranged from moderate to good. The split-half correlation coefficient was 0.65, and the Spearman-Brown corrected correlation coefficient was 0.78. Meanwhile, Cronbach's alpha coefficient was estimated at 0.85.

2.2. Study Sample:

Given the limited number of clinical psychologists in specialised centres for people with special needs, it was decided to collect data from all psychologists involved in providing psychological services across other sectors. The primary study sample comprised 62 clinical psychologists working in various governmental sectors. The following table illustrates the characteristics of the primary study sample according to the nature of the institution.

Table 4: Characteristics of the Main Study Sample

Variable	Number	Percentage
Nature of Institution		
- Public Hospital Institutions	26	41.93%
- Social Activity and Solidarity Institutions	18	29.03%
- Other Institutions	18	29.03%
Total	62	100%

The table shows that most of the research sample consisted of clinical psychologists affiliated with public hospital institutions, numbering 26 individuals, representing 41.93%. This was followed by psychologists working in the social activity and solidarity sector and other institutions, each comprising 18 specialists, representing 29.03%.

2.3. Statistical Methods

To achieve the study objectives and answer its questions, various statistical methods were employed using the Statistical Package for the Social Sciences (SPSS), version 23, as follows:

- Frequencies and percentages
- Arithmetic mean and standard deviation
- Pearson's correlation coefficient to assess the degree of correlation between scores
- Cronbach's alpha equation to assess the internal consistency of the scale dimensions
- Kruskal-Wallis test to identify differences between means

3. Presentation and Discussion of Study Results

To determine the appropriate tests for each variable (parametric or non-parametric), the researchers used the Kolmo-

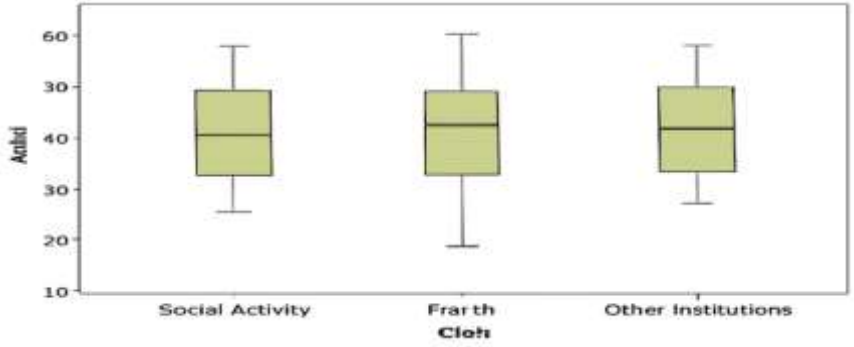
gorov–Smirnov test to assess whether the data obtained from the sample respondents follow a normal distribution. Parametric tests are used when the normal distribution and the significance level (Sig) are more significant than 0.05. In contrast, non-parametric tests are applied when the distribution is non-normal, and the significance level (Sig) is equal to or less than 0.05. The following table illustrates this:

Table 5: Normality Test (One-Sample Kolmogorov–Smirnov Test)

Variable	Number of Items	Z Value	Significance Level (Sig)
Application of Clinical Ergonomics	18	0.11	0.05

It is clear from the above table that the significance level (Sig) for the Clinical Ergonomics Application Questionnaire reached 0.05, which is equal to the significance threshold of 0.05. Therefore, not all data are typically distributed. This is further illustrated in the following figure:

Figure 1: Distribution of the Main Study Sample



3.1. Presentation and Discussion of the Results of the First Research Question

The first research question asks: To what extent are the dimensions of clinical ergonomics applied in centres for people with special needs from the perspective of clinical psychologists?

To answer this question, the mean scores of the sample members on the dimensions of the Clinical Ergonomics Questionnaire for centres for people with special needs were calculated. The following table presents these results:

Table 6: Mean Scores of the Sample on the Dimensions of the Clinical Ergonomics Questionnaire

Questionnaire Dimension	Sample Size	Mean Score	Dimension Score Range	Level
Availability of Physical Conditions in the Workplace	62	9.29	4–12	High
Design and Organisation of the Workplace	62	15.11	7–21	High
Availability of Psychological Work Characteristics	62	13.92	7–21	Low

It is evident from the above table that the dimension of availability of physical conditions in the workplace recorded a mean score of 9.29, which is high relative to the reference range for this dimension (4–12). Meanwhile, the sample obtained a score of 15.11 in the dimension of design and organisation of the workplace, which is also high compared to the

threshold for this dimension (7–21). However, the dimension of availability of psychological work characteristics in the workplace recorded a value of 13.92, which is considered low relative to the reference range for this dimension (7–21).

This result aligns with the findings of Mansouri (2016), Debraso (2010), and Taroulet (2010), which concluded that among the psychological obstacles faced by clinical psychologists, primarily related to the workplace, are the work environment itself and the limited resources available for their work, such as the use of alternative tools to standardised measures (Sidi Abed, 2022).

These results can be attributed to Algeria, like other countries, giving importance to clinical psychologists in its various sectors, particularly the health sector. This was reflected in the first fundamental law establishing psychological services, published in the Official Gazette as part of Executive Decree No. 69-73 dated 16 April 1973. This decree defined the role and conditions of employment of clinical psychologists in Article One, stating that clinical psychologists affiliated with public health primarily perform the functions of clinical psychologists, including therapy and rehabilitation, mainly within medical-social teams (Official Gazette No. 34, dated 27 April 1973, p. 522).

Due to the importance of this service, the Algerian legislator issued a new executive decree No. 91-111 dated 27 April 1991, which contained the fundamental law regarding clinical psychologists. Later, a third executive decree No. 09-240 dated 22 July 2009 was issued to specify their roles (Zohar & Terzolt, 2015, p. 102).

In the same context, a new fundamental law was published in the Official Gazette dated 29 December 2024, clarifying the integration and transitional provisions for the rank

of clinical psychologist, starting from Article 30 (Official Gazette, 29 December 2024, pp. 33–35).

However, despite this series of ministerial decrees affirming the importance and role of clinical psychologists as a professional category requiring employment and promotion, they do not explicitly address the requirements and specificities of this group, which play a role in improving the quality of psychological services.

3.2. Presentation and Discussion of the Results for the First Hypothesis

The first hypothesis states: There are statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution.

To test this hypothesis, differences between the means of the sample members were calculated using the Kruskal-Wallis test. The results are presented in the following table:

Table 7: Results of the Kruskal-Wallis Test for Differences in Mean Scores of Clinical Ergonomics Dimensions in Centres for People with Special Needs from the Perspective of Clinical Psychologists, Attributed to the Nature of the Institution

Dimension	Institution Type	Sample Size	Mean Score	Degrees of Freedom	Chi-Square (χ^2)	Significance Level (Sig)
Availability of Physical Conditions in the Workplace	Public Hospital Institutions	18	31.81	2	1.35	0.50
	Social Activity Institutions	26	28.81			

Dimension	Institution Type	Sample Size	Mean Score	Degrees of Freedom	Chi-Square (χ^2)	Significance Level (Sig)
	Other Institutions	18	35.08			
Design and Organisation of the Workplace	Public Hospital Institutions	18	31.50	2	0.01	0.99
	Social Activity Institutions	26	31.70			
	Other Institutions	18	31.08			
Availability of Psychological Work Characteristics	Public Hospital Institutions	18	25.50	2	3.04	0.21
	Social Activity Institutions	26	32.98			
	Other Institutions	18	35.36			
Overall Scale	Public Hospital Institutions	18	28.72	2	0.89	0.64
	Social Activity Institutions	26	31.42			
	Other Institutions	18	34.39			

Table 7 presents the chi-square (χ^2) values and significance levels for the three dimensions and the overall score of

the Clinical Ergonomics Application Questionnaire in centres for people with special needs. The calculated value for the dimension of availability of physical conditions in the workplace is 1.25, which is not statistically significant. Similarly, the calculated value for the dimension of design and organisation of the workplace is 0.34, which does not reach statistical significance. For the dimension of the availability of psychological work characteristics in the workplace, the calculated value is 0.92, which is also not statistically significant.

Regarding the overall Clinical Ergonomics Application Questionnaire for centres for people with special needs, the calculated value indicates that there are no statistically significant differences in the application of clinical ergonomics dimensions from the perspective of clinical psychologists attributable to the nature of the institution.

This can be explained by the fact that all ministerial decrees published in the Official Gazette do not differentiate between sectors in terms of their need for clinical psychologists; hence, the situation regarding the application of clinical ergonomics is similar across all institutions, regardless of variations in the perceived importance of clinical psychologists. Therefore, the results showed no statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution.

Conclusion

Despite the importance and role played by clinical psychologists in most sectors, the complete and comprehensive availability of clinical ergonomics in their work, especially the requirements of their profession, has not yet been fully realised. The present study indicated a high level of application of clinical ergonomics in centres for people with disabilities from the perspective of clinical psychologists, specifically in the dimensions of availability of physical conditions and design and organisation of the workplace, which both scored highly.However, the results revealed that applying clinical ergonomics in these centres does not adequately respect the specificities of psychological work in the workplace, as this dimension scored low. Furthermore, the study found no statistically significant differences in the application of clinical ergonomics dimensions in centres for people with special needs from the perspective of clinical psychologists attributable to the nature of the institution. This was reflected across institutions affiliated with the Directorate of Health, the Directorate of Social Activity, and other institutions.

Recommendations:

Based on the results obtained in this study, the researchers propose a set of suggestions and recommendations directed at decision-makers and directors of centres for people with disabilities. These aim to achieve satisfactory outcomes regarding the application of clinical ergonomics in these institutions, which will positively impact the care of this group. The recommendations include:

- Involve clinical psychologists in decision-making concerning the environmental design of their work-place, as this contributes to their psychological well-being and is a strategy likely to yield valuable results in their work.
- Provide sufficient flexibility for clinical psychologists to organise their workplace.
- Ensure institutions supply clinical psychologists with all necessary tools and materials for their speciality.
- Enact regulations specifying the environmental de-sign of the clinical psychologist's office and all essen-tial requirements to achieve positive work outcomes.
- Further studies in this field should be conducted to grant clinical psychologists and individuals with dis-abilities their due rights.

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