

Evaluation of the Physical and Mental State of Children and Adolescents with Intellectual Disabilities: Case Study of the Centre of Awakening and Rehabilitation the Pelican of Niamey

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Abstract— The objective of this study is to evaluate the general physical and mental state of the children of the centre of awakening and rehabilitation the 'Pelican' of Niamey, before their implication in adapted physical activities (APA). Thirty-one children with intellectual disabilities, including six girls and 25 boys enrolled in the centre in 2018-2019 (14.7 ± 5.6 years) and selected by reasoned choice, actually participated to this study. Height, weight, hip circumference and waist size were measured and Body Mass Index (BMI) was calculated to determine their weight status as recommended by the International Obesity Task Force (IOTF). Physical, cognitive and socio-emotional adaptive abilities were also assessed. The average BMI was 23.2 ± 6.6 kg / m², with 11 obese children, 11 with normal weight and 9 underweight. The aetiological profile predominantly revealed cases of trisomy 21 in 24 children, six of them had pervasive developmental disorders, and one of them had autism spectrum disorder (ASD). There was no problem of communication between the children studied. However, 14 of them sometimes had emotional troubles and 16 was unable to take any initiative. They all had good tone, good motor skill and easily participated to daily tasks. They had good perception and understood the instructions they were given, but sleep disturbances and feeding difficulties were reported. The results indicate that the children and adolescents with intellectual disabilities of the centre of awakening and rehabilitation the 'Pelican' of Niamey have sufficient level to participate to the adapted physical activities, proposed for their care in terms of the promotion of their mental health and the development of their sociability.

Index Terms— Adapted physical activities, care, child, intellectual disability social participation.

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I. INTRODUCTION

The notion of mental handicap is considered to be a lack of emotional, psychomotor and intellectual potentials [1]. Over time, it has evolved to intellectual disability (ID) by the World Health Organization [2]. A person with intellectual disability is perceived as a person with medical, social and psychological needs to integrate society. At the end of the middle ages, the ID is perceived as inflicted by God because of faults committed by the society. What leads to the rejection and isolation of intellectually disable people in hospitals called "asylums". They are described as feeble-minded, abnormal, stupid and to some point as 'crazy'. However, ID children are not perhaps children like the others but like the others they are children. They are children who need to play to express themselves; they need an effective and efficient care for their social participation. They also need affection, to make friends and change environments. As such they need to have access to public gardens, recreation centres and sport activities. What are they suffering from? They have trisomic-type deficiency, Schizophrenia disease, pervasive Developmental Disorders (PDD), severe behavioural disorders, foetal alcohol syndrome. All linked to genetic, biological, social, psychological and environmental factors to cause mental illness.

According to the World Health Organization [3], they are estimated at more than 450 million people worldwide and more than 25% of the world's population will suffer from it on day or another. In Niger, according to data from the last general census of population in 2012, 4.2% of the population, or 715 497 people are disabled and 0.1% have intellectual disability.

As in the past, Intellectually Disable people are still marginalised in Niger. They are hidden by parents, because they are assimilated to manifestation of witchcraft, and curse. This promotes inactivity of the latter, and a lack of care by the family, especially in disadvantaged areas. This state of affairs creates in these people inappropriate psychological behaviour (lack of affection, violence, depression), and a decrease in their physical form (languor, underweight, overweight, obesity). To overcome these physical and mental difficulties, sport has demonstrated its effectiveness and contribution not only on children with normal development, but also on those with intellectual disability.

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In a longitudinal study, [4] reports that there is a positive, significant correlation between participation to Physical and Sport Activities and the decrease in inappropriate behaviours (isolation, inappropriate interpersonal contacts, violence, anti-social behaviour and self-harm). In general, these results suggest that physical activity contributes to improving physical and mental health while facilitating the acquisition of healthy lifestyle [5]. According to the Office of Disabled Persons of Quebec [6], healthy living habits that include: daily activities, such as eating, travelling and personal care, but also social role-playing and recreational activities such as sports. They are characterised by the interaction of personal factors, such as: the organic system (height, weight, sex, age...) and personal abilities: adaptive behaviour with environmental factors that can constitute facilitators or obstacles to achieving them [7]. To highlight the effect of this interaction the following question is raised: what are the characteristics of the personal (physical state) and mental factors (adaptive behaviours) of the children of the centre of awakening and reintegration the 'Pelican' of Niamey?

II. HYPOTHESIS

In response to this question, we assumed that the children and adolescent of the centre of awakening and rehabilitation the 'Pelican' of Niamey have a favourable physical and mental condition to participation in the APA, for the promotion of their health and the development of their social participation. To verify this hypothesis the following objective is formulated.

III. OBJECTIVE

This study aims at evaluation the physical and mental state of intellectually disable children and adolescent of the centre of awakening and rehabilitation the 'Pelican' of Niamey.

IV. METHODOLOGY

A descriptive and cross-sectional study was conducted. The target population is consisted of children and adolescents enrolled on the lists of the 'Pelican' centre in October 2018. The non-probabilistic method and reasoned choice was used as a sampling technique. Thirty one (31) subjects aged 14.7 ± 5.6 years old were taken into account for this study. Six of them (19.4%) were girls and 25 (80.6%) were boys. Two categories of variables were verified as being the personal factors of the intellectually handicapped children and adolescents of the centre. They are physical parameters (Weight, waist size, hip circumference, Body Mass Index) and their adaptive behaviour relating to the capacities of: (perception, attention, contact, communication, motor skills, tonicity, understanding instructions, sleep disorders, feeding). The data collection tools and techniques used are the individual identification sheets that were used to collect the anthropometric measurement values and the ID Adaptive behavioural assessment grid developed by Barthélémy and Lelord [8]. This is a questionnaire addressed to parents of ID children and teenagers of the 'Pelican' centre. The body weight of the subjects was evaluated using a hand weighing scale of 0.1kg of sensitivity (Seca 709, France). As for the height, the measurement was made with an accuracy of 0.5 cm using a measuring board fixed to the wall. The waist size

(TT) and hip circumference (TH) were measured in cm with a non-elastic tape measure. The Body Mass Index (BMI) was calculated by dividing the subject's weight by the square of their height: $BMI = \text{weight} / \text{height}^2$ (kg / m²). Data defined by International Obesity Task Force (IOTF) were used to assess the weight status of the children [9].

As for the survey technique with parents, the questionnaire is presented as follows: it is a question of that consist of putting a cross in the box corresponding to the score judged most accurate (never for score 0, sometimes for score 1; often for score 2, usually for score 3 and always for score 4), in front of specific items such as: Search for isolation (ISO); Ignore others (IGN) etc.

Statistical analysis was performed using IBM, SPSS statistics software (version 20.0). Descriptive statistics were performed, crosses between physical factors were performed and principal component analysis was performed for personal adaptive behaviour factors with a level of apprehension ≥ 50 . The significance threshold was set at $p < 0.05$.

V. RESULTS

The figure1 shows that from the 31 subjects took into account in this study 25 (80.6%) are male and six (19.4%) are female; with an average of 14.7 ± 5.6 years old.

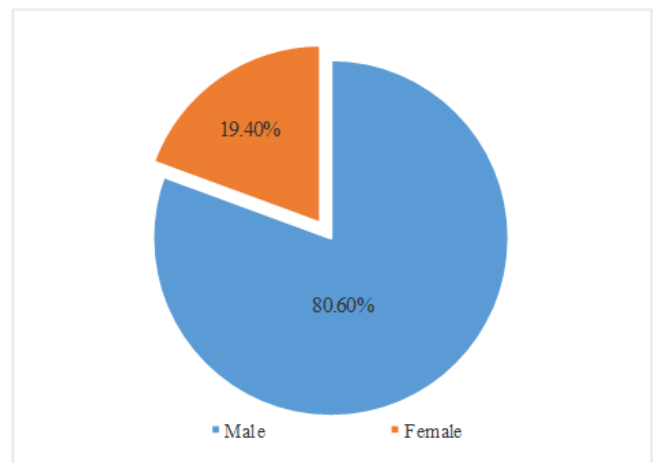
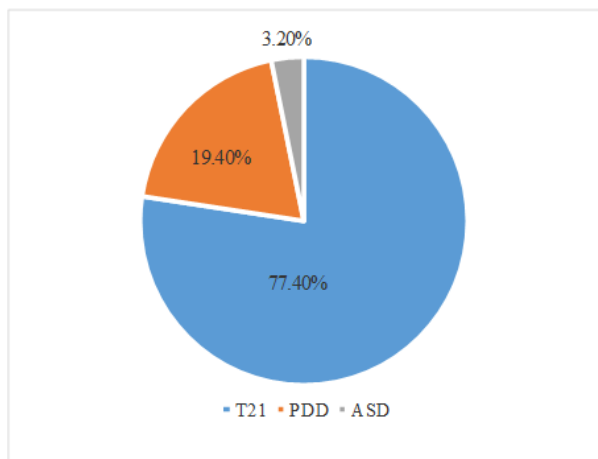


Figure 1: Sex ratio of children and adolescents of the Pelican centre of Niamey.

Intellectual disability has affected boys more than girls in Le Pelican centre of Niamey. This may imply that physical activities will be more accepted within this centre. The young boys are more likely to perform physical and recreational activities. Also, the average age (14.7 ± 5.6 years) is a strong indicator of a potentially very active age group.

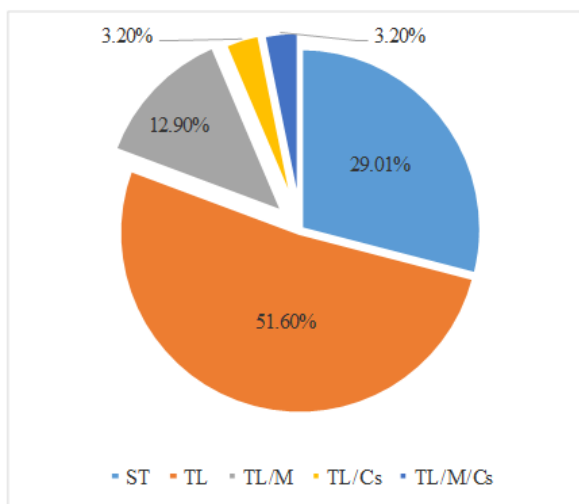
The figure2 shows that the majority of intellectually disabled children and adolescents in the Pelican Awareness and Rehabilitation Centre are suffering from Down syndrome (77.4%) followed by pervasive developmental disorder (19.4%) and autistic (3.2%). In a population of people with intellectual disabilities, trisomy 21 is a predominant type of disability.



T 21: trisomy 21 (down syndrome); PDD: pervasive developmental disorder; ASD: Autism Spectrum Disorder

Figure 2: Aetiology the children and adolescent of the Pelican centre of Niamey

The figure 3 shows that in addition to the intellectual disability (ID) caused by the Down syndrome, pervasive developmental disorder and autism spectrum disorder, other disabilities factors are associated with the handicaps of children and adolescents in the centre. These are among others language disorder that affects 51.6% (16) of the subjects. In addition to the language disorder, some subjects have motor skills impairment (12, 9%), others (3.2%) language disorder and misunderstanding of instructions and finally those (3.2%) who cumulate language disorder, motor skills impairment and misunderstanding of instructions.



ST: without troubles; TL: language disorder; TL / M: language disorder and motor skill impairment; TL / Cs: language disorder and misunderstanding of instructions; TL / M / Cs: language disorder, motor skills impairment and misunderstanding of instructions.

Figure 3: Disorders associated with the disability of children and adolescents of the Pelican centre of Niamey

The associated disorders must interpellate the sports coaches who regarding the exact king of subject they are dealing with. The orientation of the physical and recreational activities is to be adapted to each category of disable children. If, a mentally disable practitioner fails to express his need, his interest and his limits, it will be essential that the sports coach have to be more vigilant, more pedagogical and above all bear

a good sense of responsibility and patience. Regarding this category of practitioner's individualised coaching work is appropriate. To each case must be adapt a specific intervention strategy.

The figure 4 shows a predominance of obese and normal weight children (35.5% each) while 29% of them are underweight. Sports coaches and parents must pay attention to these results and take it into consideration for the care of the ID children. Coaches must be cautious in the assignment of exercises for obese and underweight children concerning the intensity of work to perform. As for the parent they must try to control and provide adequate diets to their children for the programme to be more efficient and effective. That way their children can be healthier.

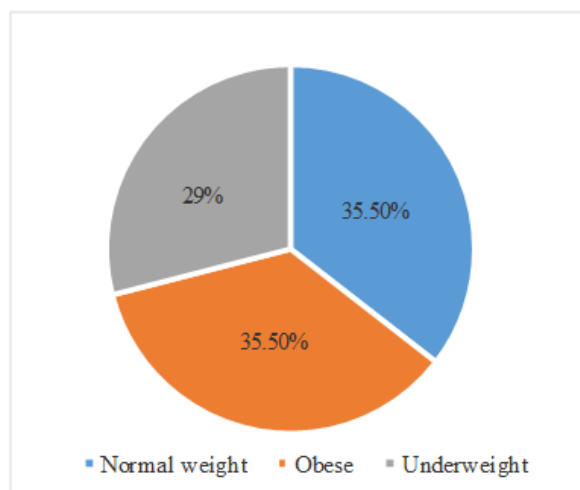


Figure 4: Weight status of children and adolescents of the Pelican centre of Niamey

The aetiological chart, the disorders associated with intellectual disability and the weight status of children and adolescents of the Pelican centre complicate their collective and / or individual care for the improvement of their physical and mental health. A strong connection must coexist between the centre's managers, teachers, parents and sports coaches in order to properly plan an adapted physical activities programme that will have a positive impact on the physical and mental health of the ID children.

Results of the figure 5 shows that all the children with normal weight are male. The obesity status is equally shared with 54.5% of male and 45.5% of female. Finally, within the underweight student, just 10.2% are females against 88.8% males. These results indicate that no girls in the 'Pelican' centre of Niger Centre have normal weight and most of them are obese.

Their adhesion to a programme of physical activities might be more difficult to handle because girls do not engage too much in physical activities. This especially due to the Niger socio-educational and cultural context where girls are more prone to household work. This constitute a limiting factor to the integration of the sport practice in the habits of the ID female children and adolescent.

The figure 6 shows that they are as many normal-weighted trisomics children as obese. The only boy with autism spectrum disorder (9.1%) has a normal weight. The majority of the subjects with pervasive developmental disorder are

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underweight (55.6%), while the remaining 44.4% of the underweighted subjects are Down syndrome.

These results recall pedagogical challenge and the innovative structuration of sports coaching during their interventions. If children have developmental problems in addition to their underweight issue, the management to improve their physical and mental health will be more challenging. Based on the

distribution of the weight status among the subjects with Down syndrome (figure 6), we assume that the weight issues (obesity and underweight) is not related to their disability (trisomy 21). In this latter category, the practice of physical activities will be easier to implement in order to improve their physical and health status.

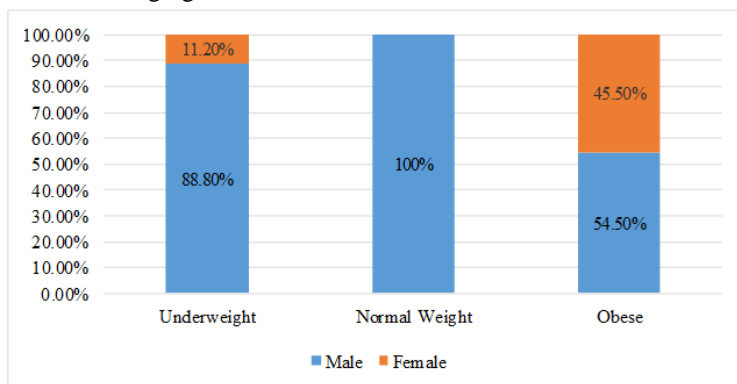
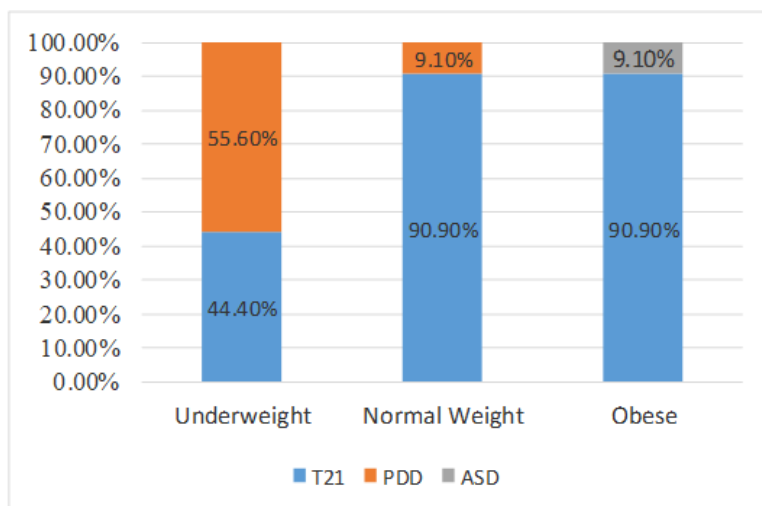


Figure 5: Relationship between weight status and sex within children and adolescent of the ‘Pelican’ centre of Niamey



T 21: trisomy 21 (down syndrome); PDD: pervasive developmental disorder; ASD: Autism Spectrum Disorder
Figure 6: Relationship between the weight status and the aetiology of the deficiency in the ‘Pelican’ centre

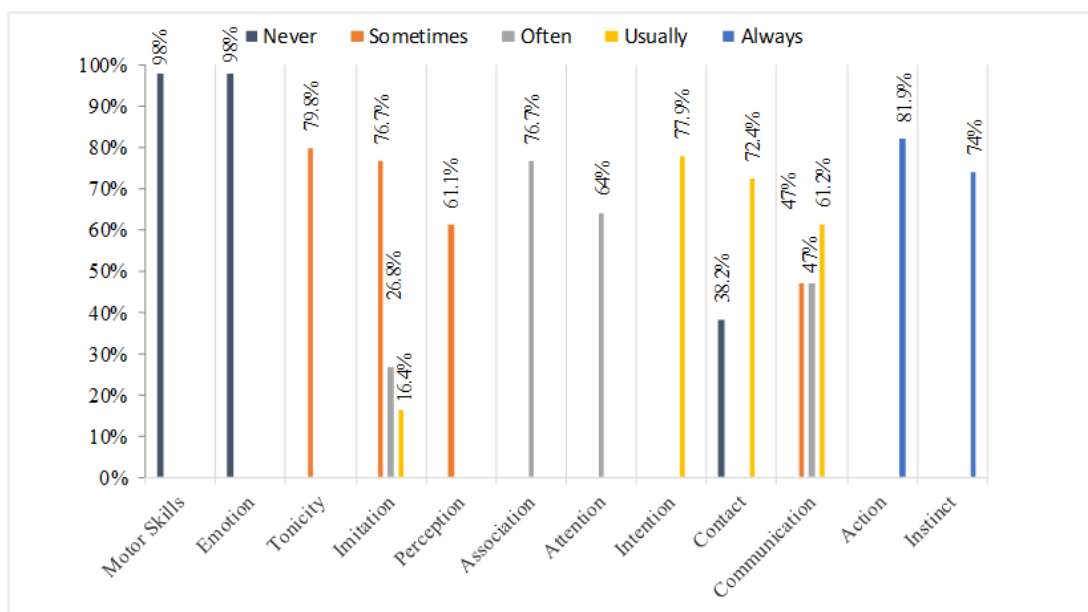


Figure 7: Personal adaptive behaviour of children and adolescents with intellectual disabilities in the Pelican centre of Niamey.

The personal adaptive behaviour factors in the figure 7 reveals the dominant values by degree of impairment of children and adolescents in Le Pelican Centre. So we notice that the large majority of the children do not have much difficulty with their motor skills and are emotionally balanced. Sometimes, they do have tone, imitation and perception issues. As for the problems of association and attention, they often occurs among the subjects. Moreover, difficulties of communication and in making contact occur very often while instinct and action issues always happen at the rate of 74 and 81.9% respectively.

These results illustrate the descriptive variations of the data collected. They also reflect the difficulties that children with ID encounter in general and especially the treatment they are subjected to. A child isolated by his parents or his entourage would likely encounter issues in making action (i.e. taking initiative or be creative). As a result, they encounter problems of communication and making contact because they are confined in an environment unfavourable to such initiatives.

VI. DISCUSION

The results of anthropometric measurements revealed that 35.5% of the children in the centre are obese. This is far beyond the rate of obesity (12.9%) of children and adolescent in developing countries in 2013 [10]. Our results corroborate those of past works that showed higher risk of overweight and obesity with ID people [10–13]. Child and adolescent obesity is a global problem that affects both normal and mentally retarded children and adolescents in developed countries as well as in low and middle income countries especially in urban areas [14, 15]. Obesity in children and adolescents is not inevitable. This is a challenge that must be tackled on the epidemiological, societal and medical level.

While its prevalence appears to be stabilizing in many countries, this is not the case in all populations. In the United States, for example, the prevalence of obesity in children with autism is 30.4%, compared to 23.6% in non-autistic children of comparable age [13]. Obesity is a marker of social and regional health fragility. Finally, in the medical field, anti-obesity programmes offer suitable recourse through structures and organizations to facilitate access to care. It remains to better value expertise and coordination of physicians working on the issue. Experiments for better management of severe obesity are being developed. This makes it possible to say that the interactions of these various initiatives with sport practice, will contribute to improving the weight status of people suffering from this deficiencies.

Overweight and obesity are defined as an excessive accumulation of body fat that presents a health risk [16]. Physical activity plays a central role in the management of an obese patient with the goal of losing weight [17–19]. It aims essentially to contribute to obtaining a negative energy balance. The prescription of physical activities must, however be adapted to the physiological and metabolic profiles of the patient. An assessment of his physical abilities during ergometrics test and a measurement of his body composition are central and determinants elements of the prescription of an adapted physical activities.

The evaluation of physical, cognitive and socio-emotional capacities of the subjects of our study revealed they can practice physical activities. This will help them to improve their physical, intellectual and behavioural abilities. Indeed, a protocol including six children aged six to seven years with a pervasive developmental disorder, showed after 19 sessions of equitherapy that their perception, their tone, their motor skills, their initiative ability, the expression of their emotion, their relationships with those around them (their contacts) and their degree of communication were improved [20]. The improvement of physical and cognitive capacities therefore has a positive influence on the health status of children with physical and mental disabilities in general and especially on their adaptive behaviours.

Besides, Buttimer & Tierney (2005) indicated that physical and cognitive abilities represent personal factors, which facilitate or hinder the participation in sports activities of people with intellectual disabilities (ID). They point out in the same way that the lack of social and communication skills constitutes one of the elements hindering sports participation, by limiting exchanges with coaches and other athletes. As for cognitive deficit, it compromises the understanding of instructions, the playing strategies and the benefits of exercise [21, 22]. It is not excluded that in accordance with the beliefs of some fringes of our populations, people with ID think that they do not have the right to get involved in a leisure or sports group with the so-called healthy population [21].

Conversely, other authors [23, 24] have paid particular attention to the motivations of special Olympians. Among other things, it emerges from their studies that male athletes with ID place high importance on their role as athletes and have a strong desire to compete. This is explained by their desire for social integration [23, 24]. Sports teachers, coaches and others who coach these particular athletes need to be imaginative and take into account the unique characteristics of each subject.

This is what the management staff of the sports programme at the Pelican centre of Niamey have been working on for the past few months in order to allow each disable child of this centre to improve their abilities. The "health walk", which represents a favourable activity for the achievement of this objective is part of the activities. A walking programme for people with disabilities therefore pursues the specific objectives of adapted physical activities. Walking is a natural exercise, one of the most basic activities of the human condition. Its learning during the first months of our lives opens the doors to independence regarding our environment. Walking is also a universal, easy and spontaneous way to stay in shape. While walking, we don't really have the impression of "exercising", so what better way to start getting in shape. One of the indisputable advantages of walking is that this activity is simple and can be practised everywhere, outdoors and indoors. However, if the simple habit of walking allows for friendly exchanges, pleasant walks, in town or in the countryside, these spontaneous activities do not have the rigour of the organized programmes, they are neither regular nor intense enough to draw, beyond the pleasure they provide, a real health benefit.

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Likewise, 98% of personal motor and emotional factors show that the subjects are likely to participate to Adapted sport activities. However, it is important to vary the Adapted sport activities by including various games and collective sports in order to effectively promote the social inclusion of these children and adolescents with others in their environment.

VII. CONCLUSION

According to the results of the physical, cognitive and socio-affective capacities in family environments, the children and adolescents with intellectual disability of the Pelican centre present a deficiency of social behaviour that must be improve by involving them in the participation of adapted physical activities.

As for the results of anthropometric measurements, the state of obesity observed in subjects drew our attention on of the benefits of PSA especially in this category of the population. Essentially these results will serve as a barometer for the development of a specific APA programme that will improve the health status and promote the development of the participation in social activities of ID children.

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