PROMOTING THE FUNCTIONAL ABILITY OF THE PERSONS WITH DISABILITIES THROUGH THE APPLICATION OF TECHNOLOGICAL DEVICES

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Abstract
It is a common belief in the society that individuals with various handicapping conditions are often seen with disdained and contemptuous minds. Their involvement in physical activities should be limited for the purpose of their fragile and delicate nature. The innovative ideas of the handlers of the programme through the means of technology have proved this wrong. The persons with disabilities can as well joyously and excitedly involve in physical activities recommended for their normal counterparts but in a modified form. This paper therefore attempts to explain the various handicapping conditions with varying physical activities they can easily engage in through the provision and application of sophisticated gadgets. It also includes likely suggestions that may further influence the active involvement of the persons with disabilities in some selected physical education activities and sports.

Keywords: Disabilities, Gadgets, Individuals, Involvement, Sports.

Introduction

The modern society is made up of good and evil, partiality and impartiality: normality and abnormality and a host of others (Famayo, 2003). This inequality started right from the biblical times when through unusual circumstances, Esau was destined to serve his brother Jacob. Thus, acquired prejudice metamorphosised into discrepancy, hatred, disintegration, apathy and neglect. This further brought about differences in physical, social and psychological behaviours of the less privileged persons in the society (Joshanloo, 2022).

In some societies, individuals displaying obvious behavioural deviations were considered from a religious point of view as evil or touched with divine powers. These people developed highly organized superstitious and religious expressions of the good and evil they saw in nature. The deviant individual, as a result, represented the unexplained and was often thought to be fraught with evil spirits (Hay & Macdolnald, 2017). In other primitive societies, children born with varying defects generally perished at an early age as a consequence of their inability to withstand the rigours of primitive man's mode of existence. Even

in the civilized societies of early Greece, the father of a crippled child in Sparta was expected to carry the baby to the hills to be left there to perish (Amheim, Auxter, & Crowe, 1977). The Athenians, who were generally considered more humanitarian than their Spartan neighbours, allowed such babies with physical defects to die of neglect (Crowe, Auxter, & Pyfer, 1981).

During the days of the Romans Empire, crippled babies suffered similar fate (Fait, 1978). At this period, physical and mental disabilities were believed to have been caused by Satan, hence, afflicted children were held to be sinful and evil (Famayo, 2021). Thus, persons with disabilities were either harshly treated or carefully avoided with the advent of modern science; the severely impaired were often regarded with disdain and suspicion, an attitude that is held by many persons in modern society (Arnheim et al., 1977)

As a result of this treatment, Crowe et al. (1981) observed that in our affluent society no longer must the less endowed person be relegated to be living outside the mainstream of life. In support of the above submission, the Rehabilitation Education for all handicapped children Act (P.L. 94-142) of 1975 rescued the handicapped from the social apathy and prejudice, when it spelt out the need for the handicapped children's involvement in physical activities, sporting events and recreation programmes in schools and communities agencies. The physically able individuals do derive a lot of benefit from participation in physical activities. The same Act (PL94-142) referred to earlier, argued that the persons with disabilities should be given equal opportunities to derive possible benefits from their involvement in physical activities (Khan & Jose, 2021).

On this note, it is important to understand that the handicapped individuals are often confronted with the problems of poor coordination, balance, strength, endurance and kinestheses, low level of physical fitness, lack of confidence and random movement (Okunrotifa, 1995; Famayo, 2021). They further maintained that the needs of the handicap include love, acceptance, growth and development, companionship, partnership, friendships, family's recognition and social interaction with their normal counterparts. They also need new skills, experiences and changes for social engagements, games, music, sports and dance.

In order to assist persons with disabilities in active involvement in physical activities, the provision and manufacturing of ambulatory devices are very necessary to suit and ease the

manipulation of the difficult skills involving great mobility (Famayo, 2003).

Consequently, the writer intends to examine the various handicapping conditions and to outline specified physical activities with the aid of artificial and technological devices available. Considerable recommendations are provided for the purpose of heighten the functional ability of the persons with disabilities in the society.

Meaning of Handicapped Children

O'morrow and Gerald (2000) contended that the words disability and handicap lead us to equate disability with inability and to speak of the handicap as being unfit or unable to maintain themselves in normal society. Reger, Rusk, & Krusen (1989) viewed handicap as an interference with natural growth and development or the capacity to learn caused by a continuous disability of body intellect or personality to such a degree as to need extra care or treatment from the medical, nursing, social or educational services.

In corroborating the above view, Lafinhan (1999) perceived handicapped persons as those who have different barriers in their mental, motor, physical, visual, emotional, hearing and other abilities to the extent that those barriers make their optimal functional status impossible. The handicapped child, as exemplified by Kirk (2000) is someone who turns away from the average normal child in mental, physical, or social characteristics to such a degree that he or she needs changes, alteration of school practices or special educational services so as to develop his maximum capacity.

With the above definitions, handicapped persons may be viewed or perceived as the less fortunate individuals whose functional abilities are marred by their deformities – in terms of physical, mental, visual and auditory composition.

Various Handicapping Conditions

There are several ways of classifying handicapped individuals ranging from the nature and severity of the disability, but for the purpose of this study, the handicapping conditions would focus mainly on etiological factors resulting into auditory, physical, mental and visual impairments.

Auditory impairment: This deals with loss of hearing to partial or total deafness. The conditions may be caused by contagious diseases (like rubella, mumps or influenza in pregnant mothers) or an acquired loss (as a resultant effect of diseases like magnates, encephalitis, measles, mumps and influenza suffered by the child). The condition can be recognized through routine physical

examination, auditory test or failure of the child to speak.

Deaf children are fond of exploring their immediate environment to satisfy their curiosity. They often exhibit severe coordination, balance problems, rigidity and random movements. Though when participating in physical activities with able counterparts, the marked difference shows in pivoting, balance, agility and turning of head awkwardly and eventually frequent falls (Okunrotifa & Okelia, 2018;Famayo,2021).

Physical impairments: Bucher (1979) concurred that physical handicaps may stem from congenital or hereditary causes or may develop later in life from environmental factors such as malnutrition from diseases or accidents. Eventually, the physical disability population consists of individual with functional limitations related to physical ability (e.g. trunk control, hand use and mobility) and medical conditions such as strength and stamina (Okunrotifa, 1992). However, he divided physically impaired into

(a) Cerebral palsy usually caused by brain damage before, during and after birth.

(b) Muscular dystrophy which is a progressive muscle weakness, awkwardness and slowness in movement, and

(c) Spinal bifida caused by cerebral column which damages the spinal cord and nerve roots, causing related neurological deficits. This type of handicapping condition usually relied on the use of wheel chairs, prosthetic objects and the likes to aid or strengthen their mobility.

Mental Retardation: Mental retardation refers to significantly sub average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during the developmental period (Geddes 1978). Lenarz (2018) maintained that mental retardation comprises all whose adaptive behavioural is inadequate and stems from incomplete development of mind and probably originate from unfavourable constitutional, social and education factors.

Psychologically, mental retardation is classified into five groups:

(a) Border line retardation IQ between 66-80 (educable)

(b) Mild retardation IQ between 51-65 (educable)

(c) Moderate retardation IQ between 36-50 (educable)

(d) Severe retardation IQ between 21-35 (educable))

(e) Profound retardation IQ between below 20 (Totally dependent).

Borderline and mild retardation IQS can still be educated to an extent; while moderate IQ is good in vocational skills, though may take a long time to learn it and the other two categories (severe and profound retardation IQS) are to live a dependent life and nursing care for the rest of their lives.

Visual impairment: This concerns persons who have problems with their sight. Anybody with a visual activity of 20/20 or less with correction is considered blind. Visual impairments are classified into two groups.

(a) Those who use their fingers to read (blind or Braille" readers); and

(b) Those that use their eyes to read (partially seeing or large type readers).

Blindness may be caused by various conditions like trauma, congenital, syphilis, infection during birth, rubella of mother during pregnancy. Blind children have difficulty in body control activities especially with regards to balance and coordination. They may be tense or rigid while walking and may adopt poor posture because of their disability. They therefore need mobility training to enhance their movement skills and ability to cope with the environment.

Physical Activities for the Handicapped Individuals

Certain orthopedic difficulties such as stiff neck, painful back, deformed limbs and shoulders are possible problems associated with handicaps, which could be corrected through physical activities. Most of these physical activities could not be easily performed with these conditions without the application of the technological/artificial devices or sophisticated gadgets that could ease or suit the mobility and kinesthetic movement.

The provision of these sophisticated gadgets actually mobilize the handicapped and spur up their performance in some physical skills and activities often display automatically by their normal counterparts, though theirs with some specifications and adjustments before the goals are realized.

Therefore, the use of ambulatory devices such as canes, crutches, wheelchairs, walkers, scooters, leg and trunk braces and leg prostheses are indispensable in athletic events and ball games for the handicapped category. The provisions of these gadgets have made the users to have acute interest in games of their choice and the manufacturers of the sophisticated equipment are still making efforts to meet and satisfy the needs of every handicapping condition in the

society so that their discomforts may be lessened or totally buried (Sefotho, 2021).

Physical Activities for the Auditory Impairment

With the exception of balance-oriented activities, the partially deaf pupils can partake in almost all physical education activities provided the precautionary measures are adhered to. The use of line, half moon and circular formations will enhance easy vision to see what other team-mates are doing. While performing athletic events colour coding materials in form of line should be placed in a conspicuous area at the beginning and end of the race. Use of earplugs are recommended when swimming for the deaf individuals to avoid further hearing difficulty.

In ball games, emphasis should be placed on easy vision to see what other teams-mates are doing through gesture cues, use of line, and circular formations so that the deaf may be fitted into the squad.

Physical Activities for the Visual Impairment

Individuals with visual problems can easily and conveniently participate in some physical education activities through the use of manufactured and sophisticated aids and devices. Some of the activities include:

- Throwing and catching, using audible balls of bean bags for improved co-ordination and reflexes.
- Swimming equipped with ropes and floating corks for improving respiratory fitness.
- Modified races of 100mt, 200mt and 400mt with the aid of audition or bell to guide the participants to the intended direction.
- Participating in modified contact sports such as soccer through the use of audible balls.
- Climbing activities by using pole or rope to develop abdominal, arm and shoulder strength.

Physical Activities for the Mental Impairment

Crowe et al (1981) opined that physical education activities for the mentally retarded could include activities that would:

(1) Develop physical and motor fitness.
(2) Develop fundamental motor skills and patterns.
(3) Develop skills in aquatics, dance and individual and group games.
(4) Emotional development; and
(5) Intellectual development.

He contended that the above stated development could be got through

activities like calisthenics, tumbling, self-testing, relays, tag-games, rope climbing, skipping, running, throwing, field trips and leaping.

Geddes (1978) listed activities like rhythmic movement, stunts, tumbling, lead up games, mini-table tennis, mini badminton, archery and mini-soccer for the mentally retarded individuals. Sounds of train, cars, planes, motorcycles can be recorded and relayed to them for identification.

Physical Activities for the Physical Impairment

For the Persons with physical disability to benefit from physical activities the use of ambulatory devices are very important to suit different orthopedics conditions. These assistive devices include canes, crutches, walkers, scooters, leg and trunk braces and leg prostheses.

Cane: is the simplest of these ambulatory devices used mainly to help maintain body balance while standing or walking. The cane may be of the straight wooden variety with a curved handle seen commonly in use. Those who have severe problems in balance need a metal cane with four feet at its base called quad cane. The cane must be held close enough to the body to maintain balance and to prevent the body from leaning toward it.

Crutches: crutches as ambulatory device offer more stability than canes. The most common and most simple are made of wood with double uprights, under-arm bar and hand piece, which is adjustable to the length of arm. Other type are made of metal and consist of a single vertical upright with a support for the fore arm, adjustments of these is done by pressing a button on the lower part of the crutch. Some of the commonly used metal crutches are the Lofstand or Guadian crutch, the Canadian elbow-extensor crutch, which extends further up the arm than the lofstand crutch and the fore arm support crutch.

All crutches whether wooden or metal, should be equipped with broad fibber tips to prevent slipping/falling. Assistance may be given to a weak or unskilled user of crutches by grasping his belt at the back with one hand.

Walker: A walker is a four-legged stand with a hand railing that extends across the front and to the sides of the body. It offers a wide base of support and provides greater security than do either canes or crutches. The two basic ones are the pick-up and the rolling walker. The pick-up is recommended for those who need more support than the use of quad cane and crutches. Individuals who do not have the strength to lift the pick-up walker or have

arm or hand problems are advised to make use of a rolling walker.

For safety reasons, the rolling walker should be equipped with a hand brake to prevent expected rolling and loss of balance. A pick up walker should be set down so that all the legs touch the surface at the same time.

Wheel chairs: The wheel chair provides a means of locomotion to those who are so severely immobilized by their condition that they cannot stand or walk even with the aid of ambulatory devices. There are manual and motorised types of various designs or make. A child in a wheelchair should be taught, to apply the brake when not in motion to avoid accident.

Scooter Boards: is a flat board to which four carter wheels are attached for easy movement. A sitting or prone lying position may be taken on the board; propulsion is created by pushing the hands against the floor. Scooter boards are excellent means of providing mobility to the handicapped children who cannot stand or who is unable to move about with any degree or speed and security. Use of the scooter board greatly, extends the opportunities for participation in physical education activities, for those with disabilities of the lower limbs. In many games, movement on the scooter can be substituted for walking and running.

Prosthesis: An artificial substitute for any part of the body is called prosthesis. That is, it is an artificial limb or part of a limb used by amputees. The individuals or students should be encouraged to make effective use of it and it should be changed as soon as the handicapped students outgrow it which is always within one or two years.

Braces: These are devices used for corrective control, or supportive purpose especially for cerebral cases or post-folio children. Corrective braces are needed for the prevention of secondary deformities during the period of growth where there is a possibility of the tendon to tighten especially at the heels and back of the knees. Control bracers are used to prevent or eliminate some of the involuntary movements especially in athetoids, while support braces provide necessary support for children who need assistance in standing.

Children wearing cast or internal fixation devices are to engage in approved recommended exercises by physicians. Deep breathing exercises (with physician's approval) are recommended, posture and breathing exercises beneficial for children wearing Milwaukee brace. Balance beam exercises of stationary, movement or stall bar varieties permitted by physicians are suggested. Specialized/approved exercises for abdominal and hip muscles, the ankles

and feet are beneficial for amputees while those performing on wheel chairs should be encouraged to engage in exercises that promote upper extremity and trunk strength. Amputees can take part in most sports with minor or no modifications to the rules of the game, however, adequate protective measures, must be taken.

Conclusion

The innovation and improvement upon the technological devices have greatly mobilized and stimulated the interest of the handicapped individuals especially those with orthopedic problems in physical activities and sports restricted to their deformities. These artificial and sophisticated equipment have really made the disabled ones to have sense of belonging in the society, that they are not totally ignored and avoided by their normal counterparts.

Some of these sophisticated materials - wheelchairs, prosthesis and the likes are making the persons with disabilities more recognised and given desired honour.

Consequently, a more comprehensive research on the artificial devices may further strengthen the fitness level of the handicapped individuals.

Recommendations

The following recommendations are highlighted for the purpose of improving and enhancing the physical ability of the Persons with disabilities through physical activities loaded with the ambulatory devices.

1. The handlers of the programme should create and have genuine interest in various handicapping conditions.
2. Most parents of the disabled ones are financially crunch in providing the sophisticated gadgets for their children, and wards and such should be greatly assisted by the community, well to do individuals and philanthropists in the society.
3. Educational opportunities in form of in-service training through conferences, workshops, clinics and short-term courses should be introduced to the Specialists and the Physical Educators.
4. It is the responsibility of the government to actually assist individuals with these handicapping conditions through scholarship awards and readily provision of devices in aiding their mobility.
5. Most of the sophisticated gadgets can easily come by through improvisation of desirable apparatuses, constructive imaginations and innovative ideas from the handlers.

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