

**THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS
OF PSYCHOLOGICAL DEVELOPMENT IN PREVIOUSLY DISADVANTAGED
SCHOOL-AGED RUGBYPLAYERS**

**Marlize Heppell
B.A. Honours (Psychology)**

Mini-dissertation (manuscript format) submitted in partial fulfilment of the requirements of the degree Magister Artium in Clinical Psychology at the North-West University, Potchefstroom.

Supervisor: Prof. E. van Rensburg
Assistant supervisor: Dr. H. Wright

**POTCHEFSTROOM
NOVEMBER 2005**

**THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS
OF PSYCHOLOGICAL DEVELOPMENT IN PREVIOUSLY DISADVANTAGED,
SCHOOL-AGED RUGBYPLAYERS**

MARLIZE HEPPELL

TABLE OF CONTENTS

Acknowledgements	i
Summary	ii
Opsomming	iv
Consent	vi
Intended journal and guidelines for authors	vii
Manuscript title, authors and addresses	ix

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation and gratitude to the following people:

- Prof. E. van Rensburg, for her guidance, professional help and support.
- Dr. S. Ellis, of the Statistical Consulting Services of the North-West University, for her help and positive recommendations.
- The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged. Opinions expressed in this report and conclusions arrived at are those of the author and are not necessarily to be attributed to the NRF.
- Louise Vos of the Ferdinand Postma Library at the North-West University, for her assistance.
- Elise Engelbrecht for the language editing.
- Dr. Hattie Wright of the School of Physiology, Nutrition and Consumer Sciences at the North -West University, who acted as assistant supervisor.
- Sonette Venter, psychometrist, Kenneth Maine, psychology student and Suzette van Wyk, clinical psychologist, who assisted with the administering of the questionnaires.
- Gerald McPherson, Development Officer at the Leopard Rugby Union.
- Melanie Claassen for the data-capturing.
- Adél Smit for her help with the formatting.
- My parents, Wim and Tiekie Liebenberg; my husband, Warrick; my son, Erik ; my daughter, Rizanne and my friend, Charien.
- The Lord for his grace.

SUMMARY

THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS OF PSYCHOLOGICAL DEVELOPMENT IN PREVIOUSLY DISADVANTAGED, SCHOOL-AGED RUGBYPLAYERS

KEYWORDS: Nutrition programme, psychological development, previously disadvantaged, primary school-aged boys, sport development programme

This study aimed to determine what the effect of a sport development and nutrition intervention programme would be on the following components of psychological development of previously disadvantaged, primary school-aged rugby players: self-esteem; cognitive development, attention and concentration and social support.

The participants were primary school boys between the ages of 9 and 14 years from disadvantaged communities. They were recruited on the basis of availability from six primary schools in the Potchefstroom area of the North West Province involved in a rugby development programme.

The research design was a randomised, single-blinded, controlled intervention study. The children were randomly assigned to either an experimental or a control group. The experimental group of children received an exercise intervention and a nutritional supplement twice a week for a period of three months. The control group received no sport or nutritional interventions during this period.

The research methodology included pre-testing, intra-testing and post-testing. With the pre-testing a comparison could be drawn between the experimental and control group regarding the above-mentioned psychological components. During the intra testing each of the 2 groups was evaluated separately regarding these components to identify any changes that could have taken place within the group from baseline to end. With the post-testing the 2 groups were compared with each other regarding these components to determine whether the nutrition and exercise interventions resulted in any markable

changes to especially the experimental group.

The results showed an statistically significant improvement in self-concept within the experimental group ($p = 0.028$) whereas no difference in self-concept within the control group was obtained. The effect of the intervention programme was not as clearly observable in any of the other psychological components. A longer duration of such an intervention programme could possibly contribute to better test results. The socio-economic circumstances of the participants played an important role in the final outcome of the study in that it influenced the social support the participants received and it also had an effect on the test behaviour of the participants.

OPSOMMING

DIE EFFEK VAN 'n VOEDING- EN SPORTONTWIKKELINGSPROGRAM OP KOMPONENTE VAN PSIGOLOGIESE ONTWIKKELING IN VORHEEN- BENADEELDE SKOOLGAANDE RUGBYSPELERS

SLEUTELWOORDE: Voedingaanvullingsprogram, sportontwikkelingsprogram, psigologiese ontwikkeling, voorheen-benadeelde, laerskoolseuns

Daar is met die studie gepoog om die effek te bepaal van 'n voedingintervensie- en sportontwikkelingsprogram op sekere psigologiese komponente by voorheen benadeelde skoolgaande rugbyspelers. Hierdie komponente behels die volgende: selfbeeld; kognitiewe ontwikkeling, aandag en konsentrasie en sosiale ondersteuning.

Die deelnemers aan die program was laerskoolseuns tussen die ouderdomme van 9 en 14 jaar uit voorheen benadeelde gemeenskappe. Hulle is gewarf , op grond van beskikbaarheid, by 6 verskillende laerskole in Potchefstroom wat by 'n rugby ontwikkelingsprogram betrokke is.

Die navorsingsontwerp was 'n ewekansige en enkelblind gekontroleerde steekproef in die vorm van 'n intervensiestudie. Die eksperimentele groep het 'n voeding- en oefeningintervensie 2 keer per week vir 'n tydperk van 3 maande ontvang. Die kontrole groep het gedurende hierdie tydperk geen voeding- of oefeningintervensie ontvang nie.

Die navorsingsmetodologie het voortoetsing, intra-toetsing en na-toetsing behels. Tydens die voortoetsing is die eksperimentele en kontrole groepe in terme van die genoemde psigologiese komponente geëvalueer. Tydens die intra-toetsing is beide groepe afsonderlik geëvalueer om enige veranderinge in genoemde psigologiese komponente wat vanaf die aanvang van die program tot met die einde voorgekom het, te identifiseer. Met die na-toetsing is die 2 groepe weer op grond van hierdie komponente met mekaar vergelyk om die moontlike effek van die voeding- en oefeningsintervensies te bepaal.

Die uitslae van die toetse het wel statisties beduidende veranderings in terme van selfkonsep teweeg gebring by die eksperimentele groep ($p = 0.028$). Die effek van die intervensies was nie so duidelik by die ander komponente nie. 'n Langer duur van die program kon moontlik tot 'n groter effek by die ander komponente gelei het. Die sosio-ekonomiese status van die deelnemers het ook 'n belangrike invloed op die toetsuitslae gehad deurdat dit bepalend is vir die sosiale ondersteuning wat die deelnemers op kan staatmaak en toetsgedrag is ook daardeur beïnvloed.

CONSENT:

We hereby give consent that Marlize Heppell may submit the manuscript for the purpose of a mini-dissertation.

It may also be submitted to the Psychology of Sport and Exercise for publication.

Professor E. van Rensburg

Doctor H.H. Wright

INTENDED JOURNAL AND GUIDELINES FOR AUTHORS

Psychology of Sport and Exercise

Notes for Contributors

Abstracts: Papers should include a structured abstract, not exceeding 250 words, covering the main factual points and statements of problem, method, results and conclusions.

Abbreviations: Avoid abbreviations except for long, familiar terms. Explain what an abbreviation means the first time it occurs. When an abbreviation is commonly used as a word, it does not require explanation (IQ).

Text: The guidelines set forth in the *Publication Manual of the American Psychological Association (5th Edition)* were followed. Figures and/or tables must not be included in the text.

General: The journal is open to the use of diverse methodological approaches. Authors should submit their articles electronically via the Elsevier Editorial System (EES) page of this journal: <http://ees.elsevier.com/pse>. The system automatically converts source files to a single Adobe Acrobat PDF version of the article, which is used in the peer-review process. The source files are needed for further processing after acceptance. All correspondence, including notification of the Editor's decision and requests for revision, takes place by email and via the Author's homepage, removing the need for a hard-copy paper trail.

Submission of a paper implies that it has not been published previously, that it is not under consideration for publication elsewhere, and that if accepted it will not be published elsewhere in the same form, in English or in any other language, without the written consent of the publisher.

Paper Length: While no maximum length of contributions is prescribed, authors are encouraged to write concisely.

Tables: Tables should be numbered consecutively and given a suitable caption and each table printed on a separate sheet. No vertical rules should be used. Tables should not duplicate results presented elsewhere in the manuscript.

MANUSCRIPT TITLE, AUTHORS AND ADDRESSES

A. THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS OF PSYCHOLOGICAL DEVELOPMENT OF PREVIOUSLY DISADVANTAGED, SCHOOL-AGED RUGBYPLAYERS.

B. M. Heppell
School for Psycho-Social Behavioral Sciences
North-West University
Private Bag X 6001
Potchefstroom
2520
South Africa

Professor E. van Rensburg
School for Psycho-Social Behavioral Sciences
North-West University
Private Bag X 6001
Potchefstroom
2520
South Africa

Tel: 018 – 2991727

Fax: 018 - 2991730

E-mail: psgevr@puknet.puk.ac.za

Doctor H.H. Wright
School of Physiology, Nutrition and Consumer Sciences
North-West University
Private Bag
Potchefstroom
2520

Tel: 018 – 2992466

Fax: 018 - 299 2464

E-mail: vgehw@puk.ac.za

C. Statistical Consultant: Dr. S. Ellis
Statistics Department
North West University

D. Word Count: 13730

**THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS
OF PSYCHOLOGICAL DEVELOPMENT OF PREVIOUSLY DISADVANTAGED
SCHOOL-AGED RUGBYPLAYERS**

Marlize Heppell : B.A. Honours (Psychology)

Esmé van Rensburg*: Ph.D. (Psychology)

Hattie Wright: Ph.D. (Nutrition)

Marlize Heppell is a Master's student in Psychology at the North-West University. Professor Esmé van Rensburg is an associate professor and Psychologist at the North-West University. Dr. Hattie Wright is a senior lecturer at the School of Physiology, Nutrition and Consumer Sciences at the North-West University. Correspondence can be forwarded to the School of Psycho-Social Behavioral Sciences, North-West University, Private Bag X 6001, Potchefstroom, 2520, South Africa, Tel: 018 2991727.

* To whom correspondence should be addressed.

**THE EFFECT OF A SPORT- AND NUTRITIONAL PROGRAMME ON COMPONENTS OF
PSYCHOLOGICAL DEVELOPMENT IN PREVIOUSLY DISADVANTAGED SCHOOL-
AGED RUGBYPLAYERS**

ABSTRACT

Objectives: The study aimed to determine what the effect of a sport development and nutrition intervention programme would be on the following components of psychological development of previously disadvantaged, primary school-aged rugby players: self-esteem; cognitive development, attention and concentration skills and social support.

Methods: The research design was a randomised, single-blinded, controlled intervention study. The children were randomly assigned to either an experimental or a control group. The experimental group of children received an exercise intervention and a nutritional supplement twice a week for a period of three months.

Results: The experimental group showed an improvement regarding self-esteem at the end of the programme (the results were only statistically significant: $p= 0.028$). A high percentage of participants experienced problems with attention and coping skills.

Conclusions: Self-esteem was the first component to be influenced by the intervention programme. The disadvantaged background of the children influenced their behaviour on a broad spectrum. Practical problems were experienced, like educational language versus first language and the ability to handle the test material. The duration of the programme could have influenced the results (12 weeks seem to be too short).

INTRODUCTION

Primary school-aged boys from previously disadvantaged communities rarely have the opportunity to participate in structured physical activity and competitive sport (Berg, 1973). Nutritional intakes of these children are also often suboptimal and indicative of malnutrition, which could have a negative effect on physiological and psychological development (Klugman, 2002). The National Food Consumption Survey reported that for South African children as a whole, the average dietary intake was less than 67% of the Recommended Dietary Allowances (RDA), and in many cases below 50% of the Recommended Dietary Allowances (as cited in Klugman, 2002). Depending on the nutrient and the severity of deficiency, the consequences of malnutrition may include impaired physiological development and certain diverse psychological components, for example social, affective and cognitive processes as well as behaviour. The aim of this intervention study is to improve these components of Black primary school boys' psychological functioning.

The physical health benefits of regular physical activity are well-established (World Health Organization – Committee on Physical Activity For Health, 1995). Regular physical activity promotes a longer and better quality of life, reduced risk of a variety of diseases and has many psychological and emotional benefits (Biddle, Fox & Boutcher, 2000; Biddle & Mutrie, 2001; Sallis & Owen, 1999).

Regular physical activity contributes to the acquisition of fundamental motor proficiency which is an important goal for early childhood (Freedson & Bunker, 1997). Children must learn to control their bodies in space and they need to acquire the fundamental skills which will help with recreational or leisure activities (Freedson & Bunker, 1997). Activities in childhood must include both the motor and health aspects of physical fitness, because children need a reasonable level of motor skill development to take part in exercise and sport activities which will provide them with endurance, power and strength. Children also need reasonable levels of fitness to engage in exercise and sport activities which will provide them with physical activity as adults (Freedson & Bunker, 1997).

For children to take part in regular physical activities their nutritional intake needs to be on satisfactory levels. It is indicated that children with protein energy malnutrition and micronutrient deficiencies have a lower physical activity level than well nourished children (Pollit, 2000). It was shown in a review (Pollit, 2000) that undernourished children try to maintain energy balance by either decreasing the frequency and duration of high-energy activities, or decreasing the intensity of motor actions. This can contribute to unbalanced

anthropometric proportions, weakened muscle strength and maturation causing limited acquisition of motor skills, and finally decrease their drive for exploration (Pollit, 2000).

Undernourished children tend to develop immature emotional states and insecure attachment styles and this contribute to a decrease in physical and social environment exploration (Graves ,1978; Pollit, 2000; Thompson, 1994). Protein energy malnutrition and certain micronutrient deficiencies such as iron, zinc, cobalamin, and vitamin B6 have been identified as developmental risk factors for cognitive development (Guilarte, 1993; Kopp, 1994; Louwman et al., 2000).

Exercise can have both a positive and a negative effect on psychological health, according to McAuley (1994). Positive correlations can be identified between exercise and self-esteem, self-efficacy, psychological well-being and cognitive functioning, and negative correlations between exercise and anxiety, stress and depression. Scully et al. (1998) concluded that attention has turned towards the specific effects of exercise on particular psychological functions and conditions and that the literature remains inconclusive as to the relation between exercise regimens and overall psychological well-being. In a literature analysis, Ruoff (1995), investigated the connection between sport or exercise and well-being. The type of exercise in this studies involved water and flexibility sessions with additional swimming, walking or aerobic dancing. One study asked about the frequency of sports team participation and the other dealt with non-team physical exercise. Another study assigned their participants to either an exercise programme or a control condition designed to simulate physical training. Sports involvement was also measured on several dimensions including behavioural, affective and cognitive interest in sports. One study compared female athletes to nonathletes on both well-being and body image. Four of the seven exercise studies that were examined pointed to a relationship between exercise and well-being. Callaghan (2004) underlines this opinion and provides detailed evidence-based information on the effects of exercise on mental health and well-being, the use of different exercise regimens to fit clients' needs and abilities, as well as addressing ethical issues relevant to exercise.

Some particular psychological functions that are influenced by regular exercise, include social, affective and cognitive functioning. Numerous studies have demonstrated that well structured and presented physical activity programmes can contribute to development of prosocial behaviours (Svoboda, 1994). Academic performance can also be enhanced by physical activity. Bailey (2004) refers to existing studies which suggest a positive relationship between intellectual functioning and regular physical activity, both for adults and children. The role physical activity plays in cognition and the relationships between activity

and mental development seems to be based on developmentally meaningful actions tied to critical gross motor actions (Pollit, 2000). The International Society of Sport Psychology (1992, p. 179) stated the following: "studies have shown that the process of exercise brings about both short- and long-term psychological enhancement and mental well-being. Aerobic activity can reduce anxiety, depression, tension and stress and it can increase vigour and promote clear thinking".

From the above it is therefore clear that physical activity plays an important role in the physiological, sociological and psychological development of children. It is also clear that semi-urban children, especially those from a poor socio-economic environment and previously disadvantaged communities, have an increased risk for suboptimal physiological, sociological and psychological development due to low physical activity levels and also possible undernutrition. These facts were the motivation for this study in which the impact of appropriate interventions to address the problem will be evaluated.

The aim of the study is to assess the impact of a sport development and nutrition intervention programme on the following psychological components, cognitive development, attention and concentration, self-concept and social support in previously disadvantaged school-aged rugby players.

Literature Study

The relationship between exercise and self-esteem

The several slightly different yet related constructs, such as self-esteem, self-concept, self-confidence, perceptions of competence and self-efficacy essentially refer, according to Weiss (1993, p. 41): "...to the description of, evaluation of and affect toward one's competencies". Fox (2000b, p. 89) describes self-esteem as: "...a self-rating of how well the self is doing". The criteria on which self-esteem is based are, according to Fox (2000b), ultimately set by the individual. He describes self-esteem as essentially phenomenological and that the effect of exercise on self-esteem cannot be explained in the absence of consideration of the past experiences and values of the individual.

Self-esteem is regarded by Sonstroem (1997) as an important indicator of emotional stability and adjustment to life demands. It is closely allied to subjective well-being and happiness (Diener, 1984). It is through our bodies that we explore, learn, present ourselves and express our sexuality (Fox, 1998). Our physical selves provide the basis of our self-esteem

and many of our behaviour patterns.

Physical self-worth can, according to Fox (2000a), be promoted by exercise. Exercise influences physical self-concept so that people can develop a higher degree of physical acceptance. This should then lead to a better global self-esteem. Boyd and Hrycaiko (1997), Koniak-Griffin (1994), McAuley et al. (1997), Palmer (1995) as well as Pronk et al (1995), endorse this perception and say that it is fairly consistent across different age ranges and length of exercise programmes as well as intensity of exercise. Positive changes can be experienced by both men and women, according to Fox (2000a).

Improvement of self-esteem is not an automatic outcome of exercise programmes though. In some situations there is improvement in self-esteem and in others there is no change. Positive changes can be experienced by all age groups but there is greater evidence of change in children and middle aged adults. As reviewed by the Centers of Disease Control and Prevention (CDCP, 1997), regular physical activity increases levels of self-esteem and self-concept while decreasing levels of anxiety and stress in children and adolescents. Fox (2000b) also refers to the importance of the physical self to exercise and mental health. Various comprehensive instruments have been developed to assess self-ratings of the physical domain (Fox, 2000b). The Physical Self-Perception Profile of Fox and Corbin measures perceptions of sport competence, physical strength, physical condition, body attractiveness and overall self-worth and the Physical Self-Description Questionnaire of Marsh, Richards, Johnson, Roche and Tremayne (1994) measures nine elements of the physical self (general physical self and general self-esteem) and there are also instruments to measure singular aspects of the physical self, such as body image, body satisfaction, body acceptance and social physique anxiety. Children's self-esteems are an important part of their psychosocial development and is reflected in their behaviour and ability to adjust to demands of their environment (Haynes, 1990).

Studies have reported significant correlations between self-concept and achievement (Dean, 1977; Purkey & Smith, 1982). A meta analysis of 27 studies was conducted by Gruber (1986) on the positive effect of physical activity on self-esteem development in children. An overall effect size for physical activity on self-esteem of 0,41 (statistically significant) was found, meaning that children experiencing a physical activity intervention displayed self-esteem scores nearly one half of a standard deviation (0,41) higher than equivalent children in control groups.

Weiss, McAuley, Ebbeck and Wiese (1990) refer to the findings of a study with boys and girls (8 – 13 years) who attended an educational summer sports programme which showed that the children with higher self-esteem made attributions for their physical competence that were more internal, stable and personally controllable than did the children with low self-esteem. This underlines the importance of enhancing self-perceptions as a means of encouraging motivation for physical activity participation (Horn, 1987).

The following components were highlighted by Fox (1988) as important to enhance self-esteem in children through physical activity:

- An environment that encourages a sense of fitness competence ought to be provided by educators. The process of achieving fitness is more important than the product of fitness. The focus must be on self-improvement and mastery of goals rather than individual comparison or ego-orientated goals.
- An understanding of the importance of activity for health rather than for skill or performance.
- The greatest effects of physical activity are often found in children with initially low self-concepts and self-esteem improves with participation in physical activity regardless of physical activity type (Sonstroem, 1984).

High self-esteem individuals are more likely to participate in exercise programmes according to various researchers (Albinson, 1974; Tucker, 1983; Young, 1985). Frank and Gustafson (2001) argue that the relation between self-esteem and exercise has been fairly established although uncertainties exist regarding the methods to induce individuals low in self-esteem to voluntarily engage in exercise. A tendency among individuals with high self-esteem to engage more easily in sport participation or exercise programmes can be understood through Bandura's concept of reciprocal determinism. This theory indicates that behaviour, personality and environment interact together to determine personality and behaviour. The personality trait of positive self-regard leads to the adaptation of exercise behaviour and this, in turn leads to greater positive self-regard. The impact on one another is a reciprocal process (Bandura, 1977).

An increased self-esteem and exercise behaviour can exercise an impact on environmental conditions, according to Frank and Gustafson (2001). Via exercise the individual comes into contact with others who are more interested in fitness and that may encourage the continuation of these behaviours. Koniak-Griffin (1994) and Palmer (1995) speculated that the social contact may be a mechanism of change for self-esteem. It is not certain in the research whether the improvements in self-esteem are directly related to engaging in

