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SOUTH AFRICAN CRICKET AND THE ANGLO-BOER WAR, 1899-1902

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ABSTRACT

With cricket already established in the colonies of Southern Africa, an intended tour to England during 1900 by a South African team was cancelled as a result of the outbreak of the Anglo-Boer War. Underestimating their opponents in the war and believing that the conflict would soon be won, the English cricket authorities requested that the tour be undertaken instead during 1901. Of course the war dragged on but the predominantly 'Uitlander'[2] team did go, leaving Cape Town on what was to prove a testing, if somewhat ground-breaking tour. This paper will investigate the background to this tour, the controversy it created and the development of South African cricket during this time of war.

Key words: Cricket; South Africa; Anglo-Boer War; Imperialism; Logan; Conan-Doyle.

INTRODUCTION

Cricket first came to South Africa with the military between 1795 and 1802 in the earliest days of the British regime (Winch, 1997: 16). Members of the garrison which occupied the Cape in 1806 found time to play cricket and two years later the first known reference to a cricket match being played in South Africa appeared in the *Cape Town Gazette and African Advertiser*.[3] However it was not until later that century, with the arrival of British settlers, that the game started to spread elsewhere. 1843 saw the first organised cricket club appear in Port Elizabeth, followed a year later by one at Wynberg in the Cape. Further north, the first 'rush' on the Diamond Fields swept cricket into the Kimberley region, with the Orange Free State receiving its first cricket club in Bloemfontein during 1855 (*Diamond Fields Advertiser*, 1899: 19). The first Transvaal club opened in 1863 (Archer & Bouillon, 1982: 81).

On the whole, cricket seems to have been regarded with approval. An integral part of the assimilation process and steeped in British tradition, it was encouraged as promoting the manly virtues of courage, patience, endurance, good temper and courtesy (Odendaal, 1988:

[1] This article is deriven from the first author's Master's study submitted to Stellenbosch University.
[2] Literally an 'outlander' or foreigner, this was the name given to those (mainly British) immigrants who flocked to the Transvaal after the discovery of the Witwatersrand gold-fields in 1886 (Saunders, 1994: 243).
[3] The notice read: "A grand match at cricket will be played for 1,000 dollars a side on Tuesday, January 5, 1808, between the officers of the Artillery Mess, having Colonel Austin of the 60th Regiment, and the officers of the Colony, with General Clavering. Wickets to be pitched at 10 o'clock" (*Cape Town Gazette and African Advertiser*, 1808; in Winch, 1997: 16).

196). Through its promotion in South African schools, the game soon began to flourish in the towns whilst in the country districts a cricket match became an important social event (De Kock, 1955: 79). With such growth during the Victorian era, this paper will explore the development of the game within South Africa during the Anglo-Boer War, as well as the controversy that surrounded the second South African tour to England, in 1901.

CRICKET'S EMERGENCE

In England in the late 19th century cricket was as popular as ever, no longer confined to certain social groups or regions. It had become, as Holt explains, *the* English national sport via its spread from eighteenth century gentry to the growing Victorian middle classes and industrial workers of the cities. Whilst the winter sport of football remained divided from the outset into its 'association' and 'rugby' codes, cricket became *the* universal English summer game with great cricketers emerging as national figures in a way other sportsmen could never achieve (Holt, 1996: 48).

In 1888 the first English tour of South Africa took place. Under the management of Major R. Gardner Warton and captained by C.A. Smith, the team played and won two tests against a representative South African side at the Wanderers Club in Johannesburg (Lee & Stent, [1960]: 61).[4] The tour at the time was significant. Not only did it raise the profile of cricket in South Africa, but it was also the year when the Currie Cup was born.[5] Like Australia some years earlier,[6] South Africa had seemingly arrived as a legitimate cricketing colony.

A South African team had already visited England for the first time in 1894, when Lord Hawke led a troubled tour back to South Africa during the 1895-96 season. Coming at the time of the ill-fated Jameson Raid, Anglo-Boer tensions were at a peak and the tour was constantly shrouded by the political crisis in the country (Pardon, 1897; Hawke, 1924). Three years later Hawke was persuaded by the Honourable J.D. Logan to bring out a second tour to South Africa. The country however, had not regained its stability.

The railway line had been extended from Kimberley to Bulawayo in 1897 and two matches were to be played during this tour for the first time in Rhodesia (now Zimbabwe). With players such as Jimmy Sinclair emerging, South African cricket had also shown a remarkable improvement since the previous tour (Knowles, 1995: 35). However, the threat of unrest once again loomed menacingly over the country. Cecil Rhodes had resigned as Prime Minister of the Cape Colony as a result of the Jameson Raid but was again involved in Cape politics. Lord Milner, Governor and High Commissioner of the Cape Colony, was in London to discuss the Transvaal problem with the Foreign Minister Chamberlain. The Anglo-Boer War was imminent.

[4] It would have been common at this time for a team of England's status, to have faced teams who batted more than 11 men. England's first game against Western Province, for example, saw them having to dismiss 22 opponents (Lee & Stent, [1960]: 61).

[5] Sir Donald Currie, founder of the Castle Shipping Line, offered the cup as a floating trophy to the South African team which showed the best form against the English tourists. Kimberley were the first recipients in 1888.

[6] For an insight into Australian cricket's colonial past, see Mandle (1978) and Adair *et al*. (1997).

THE EFFECT OF WAR

Despite the increasing political tension, it was a time in South Africa when talk was of arranging fixtures with the world's cricketing powers. At a meeting of the Western Province Cricket Union (WPCU) on 8 June 1899 approval was given to invite the Australian team, at that time touring England, to play a number of matches in South Africa on their return home. In view of this, the WPCU delegate to the South African Cricket Association meeting at Johannesburg was instructed to say that the sending of a South African team to England in 1900 was not advisable (*Cape Argus*, 1899a: 5).

In fact it was not until the Honourable J.D. Logan of Matjiesfontein stepped in to support the England tour, that the enterprise began to receive favour. In an interview that appeared in the *Cape Argus* on 17 August 1899 Logan stated that he would undertake the financial responsibilities of an English tour and that with Lord Hawke's assistance he would arrange a series of first class fixtures. Despite doubts from the Orange Free State Cricket Union that a South African team was ready to test first class English counties, Logan's proposal was adopted at the AGM of the South African Cricket Association (SACA) at the Wanderers in Johannesburg on 31 August 1899 (*Cape Argus*, 1899b: 5).[7] With peace in South Africa now hanging in the balance, it was agreed that SACA would write to Lord Hawke, asking him to arrange a first class fixture list for the team at a meeting of county secretaries in England.

Despite the outbreak of war on 10 October 1899, a month or so later the *Cape Argus* was still confident that the 1900 tour would proceed:

> Notwithstanding the war, it is now almost certain that a South African team will visit England during the next English season. Provisional team already selected (*Cape Argus*, 1899c: 5).

The first few months of the war however did not go as planned for Britain. Shock defeats by the Boers had seriously knocked her imperial agenda. Despite optimism in the South African press and the English cricket programme for the summer of 1900 including the South African fixtures,[8] by the end of 1899 it was difficult to see how this tour was now possible. By February of 1900, with the reality of the situation clear, the *Cape Argus* reported how:

> Little or nothing further has been heard with regard to the South Africa team for England – it seems practically impossible for the team to be got together in view of the turn affairs have taken with regard to the war (*Cape Argus*, 1900a: 5).

Then, on 2 March 1900, Lord Hawke received the cable he had been expecting announcing that the tour by the South Africans would have to be abandoned (*Times*, 1900a: 12).

It was a time too when domestic cricket had to take a back seat to the war effort. Along with thousands of workers of that period, many cricketers had moved to the Transvaal following

[7] According to Logan's offer, SACA would select the team. The finances would devolve upon Logan who stipulated that he should appoint the manager (*Cape Argus*, 1899b: 5).

[8] First match scheduled 21 May 1900, versus Hampshire at Southampton. Final match 23 August 1900, versus MCC and Ground, at Lords (*Cape Argus*, 1899f: 5).

the development of the gold fields. With the war imminent however, men living in the South African Republic were required to serve in the burgher forces. As a result, there was a flood of refugees who moved back across the borders into Natal and the Cape Colony to avoid conscription. The test cricketer Jimmy Sinclair was one of these and soon the local cricket clubs benefited by arranging matches against these 'refugee' players. On 7 December 1899 Cape Town Cricket Club played a refugee team that included A.B. Tancred, T. Routledge, J.H. Sinclair, A.E. Halliwell and G. Devenish (*Cape Argus*, 1899d: 5). Nine days later this same team took on the strength of the Western Province Cricket Club (*Cape Argus*, 1899e: 5). For a brief period cricket in the Cape flourished due to the war, but with the call up of players this was not to last.

On 8 March 1900, the *Cape Argus* reflected how "Cricket in the Peninsular has fallen on evil times. For three Saturdays the premier club has not had a fixture" (*Cape Argus*, 1900b: 5). For Cape Town Cricket Club the 1899-1900 season was also a failure with the war being blamed for lack of senior competition and the meagre gates at games (Cape Town Cricket Club, 1900). Not only was there decline in public support for the game but also cricket grounds were at a premium in the Cape as the military moved in. Greenpoint Track for example, was soon being used as a prisoner of war camp. The *Cape Argus*, of 9 October 1900 declared:

> We are at a crisis in the history of cricket … Either some steps must be taken to re-kindle the flame of enthusiasm for our national game, or it will go to the wall completely and we shall be left with a number of second-class clubs struggling along season after season with no hope of advancement (*Cape Argus*, 1900c: 6).

Only the fixture between Western Province and Cape Town Cricket Clubs attracted a modicum of interest, yet by March 1901 even this match had declined in significance: "With half the players away on military duty, the struggle lost most of its importance. Very few cricketers put in any practice – a marked deterioration in the style of play" (*Cape Argus*, 1901a: 4; *Cape Argus*, 1901b: 5).[9]

Later that month South Africa College defeated both Western Province and Cape Town Cricket Clubs in the annual championship challenge. Under ordinary circumstances South Africa College would have had little chance of securing this distinction, but as the senior clubs were weakened due to prominent members serving at the front, the College team were able to seize their opportunity. Cape Town Cricket Club alone was without the services of Rowe, Kuys, Halliwell, Horwood and Jones for the fixture (Cape Town Cricket Club, 1901a).

At the AGM of the Cape Town Cricket Club on 16 August 1901, the chairman, L.B. Smuts, explained that there was no report owing to the unrest up-country, a result of which, a great number of members were absent during the season (Cape Town Cricket Club, 1901b). Similarly, the Western Province Cricket Club reported at their AGM some ten days later, that the second invasion of the Cape Colony by Boer forces gave rise to a general call to arms and many of the club's best players joined the forces to protect the Colony. This lead to some

[9] Reaction to the derby match at Newlands on 9 March 1901 which Western Province won by five wickets (*Cape Argus*, 1901b: 5). A large advertisement for the fixture (along with entertainment from the Band of HMS Doris) had appeared in the *Cape Argus* the day before (*Cape Argus*, 1901a: 4).

difficulty in carrying out the Club's engagements, and mid-week fixtures in the latter half of the 1900-1901 season were abandoned (*Cape Argus*, 1901c: 5).

The war was affecting cricket in different ways. At that same AGM, the Western Province Club debated the matter of having a prisoner of war, who was on parole, as a member. Henry Cloete proposed, and Vincent van der Byl seconded, a motion, "That it was undesirable to have a general rule excluding prisoners of war on parole from membership in the club" (*Cape Argus*, 1901c: 5). This was the outcome of the committee's action in refusing the privileges of the club to C. Fichardt, of Bloemfontein, who was first elected and subsequently had his subscription returned, on the grounds that he was a prisoner on parole. The mover and seconder wished it to be understood that their action was in no sense a reflection on the past committee and the motion was carried by eight votes to five (*Cape Argus*, 1901c: 5).

Going into the 1901-1902 season with the war nearing its end, interest in cricket again slowly began to build. The *Cape Argus* of 27 December 1901 reported how an "immense crowd" and "record gate" had watched a Colonial-Born team defeat a Mother-Country eleven in Cape Town as, by this stage, cricketers were returning from military duty. The teams contesting this particular fixture included such players the calibre of A. Reid, H. Carolin (who was later vice captain of the 1906 rugby Springboks), S. Horwood and Murray Bisset (*Cape Argus*, 1901e: 5).

Then, in October 1902 with the dust of the war barely settled, South African cricket received another boost when the Australians, captained by Joe Darling, toured the country on their way back from defeating England in the Ashes. In the wake of the war, Colonial ties were strengthened here too as Australia won two Tests – the third was drawn (Winch, 1997: 48). Dr. George Thornton, who had occasionally played for Yorkshire and Middlesex, was a member of the South African squad. He was one of the first medical men to volunteer his services when war broke out and who stayed on in South Africa after the war had ended (Wessels, 1992: 19).

THE 1901 TOUR

The fact that organised sport had continued during a time of hostilities sat uneasily with a number of those involved. Dr. Francis Fremantle found time in his busy schedule tending the wounded at Wynberg General Hospital, to go and watch a game between the Refugees and the Western Province Cricket Club at Newlands. He wrote the following in his diary:

> *Saturday, January 27th*: A quiet match like this in the middle of war is like the theatres in the French Revolution, when, as Carlyle puts it, the French nobility were going to the guillotine, and all the while the 'fiddlers were tweedle-deeing on melodious catgut' (Fremantle, 1901: 151-152).

This was of course early 1900, in the midst of the conventional phase of the war when British casualties were high. With regards to the proposed tour of a South African team to England in 1901 Fremantle wrote that the Cape players felt the situation very deeply. Murray Bisset, the secretary and captain of the Western Province Cricket Club had, on several occasions, told

him that quite apart from the absence of Jimmy Sinclair and other prominent cricketers at the front, it would be impossible to get up the proposed South African team to visit England – "the fellows wouldn't go!" he reportedly said (Fremantle, 1901: 152).

However, as the balance of the war began to swing towards Britain, a team financed by J.D. Logan was eventually selected and Bisset agreed to lead the South African team to England. Due to begin in May the following year, the 1901 tour was announced by Lord Hawke in *The Times* on 1 December 1900 (*Times*, 1900b: 9).

The orchestrator of the 1901 tour was James Douglas Logan. Born in Reston Scotland on November 26, 1859, Logan had emigrated to South Africa where, with an entrepreneurial mind, he had made his fortune securing the catering contract for the South African Railways (see Toms, 1997). Affectionately referred to as the 'Laird of Matjiesfontein', after the small Karoo town he had developed, Logan's deep affection for cricket undoubtedly helped to popularise the game in South Africa (Toms, 1997: 51). A succession of distinguished cricketers were enticed to the new colony by Logan's almost fanatical devotion to the game. Lord Hawke's teams came to South Africa as a result and George Alfred Lohmann, an England fast bowler, was brought to the Cape at the personal invitation of J.D. Logan himself (Toms, 1997: 55; *Cape Argus*, 1901d: 5).[10] In September 1899, Logan had said:

> I look to the good old English game of cricket to do much towards uniting the different classes in this country … and it is my ambition that the day will come when a team will go to England as good as they can send from Australia (in Toms, 1997: 125-126).

Despite the outbreak of war a month later, Logan was to eventually get his wish. Following the abandonment of the tour in 1900, approval was given to reschedule for the 1901 English season. The tourists, referred to in the press as 'the South Africans', 'the Colonials' and 'Logan's team' were captained by Murray Bisset and managed by George Lohmann. Among the fifteen players was a young Jimmy Logan Junior, who went on to play in eight first-class innings, averaging just over 12 runs (MCC, 1901e: 368). Also part of the squad was Johannes Jacobus Kotze, a Boer and one of the fastest bowlers ever to appear in first-class cricket in South Africa (MCC, 1904: 388; Bailey *et al*., 1983: 608). The team is pictured in Figure 1.

[10] Lohmann (England 1884-1892) was said by many to be the greatest cricketer of his generation. In 1892 however, at the age of 27, Lohmann developed tuberculosis and travelled to Cape Town in search of a cure. In the clear air of the Karoo, Lohmann stayed with Logan on and off until his death on 1 December 1901 (Toms, 1997: 55 & *Cape Argus*, 1901d: 5). His impressive tomb erected amongst others by Surrey County Cricket Club, still pays tribute today in the graveyard at Matjiesfontein.

FIGURE 1. **SOUTH AFRICANS, 1901**
W. Shalders, L. Tancred, M. Hathorn, J.H. Sinclair
G. Rowe, E. Halliwell, M. Bisset, J.J. Kotze, R. Graham
J.D. Logan, Jun., A. Bisset (Standing, n.d.: 57)

With the conflict in South Africa still raging, Kotze, since described as the 'Boer farmer who preferred cricket to war' (Martin-Jenkins, 1980: 292), acknowledged the difficult circumstances under which the tour took place. The previous year the tour had been postponed and when, unexpectedly, the war continued into its second year there were doubts too as to the wisdom of sending a team over in 1901.

> It was suggested that the tour should be again abandoned and the English authorities were advised accordingly. The answer was that the team must come under any circumstances, or otherwise the entire county programme would be dislocated for the season (Kotze, 1915: 663).

Even the departure of the team from Cape Town was none too auspicious. Apart from the country being in a state of war, Cape Town was at the time being visited by the bubonic plague. On account of plague regulations in the docks area, the players subsequently left the Cape without even the customary send-off (Kotze, 1915: 663).

Following their arrival at Southampton on 3 May 1901 (*Times*, 1901: 9), the South Africans went on to play twenty-five matches over the next three months. Despite a poor start, in which they lost their first five matches (Tancred, [1915]: 29), the tourists went on to record a total of thirteen victories, nine losses and three draws (MCC, 1901e: 368). Included was the highest

total ever made by a South African team in first class cricket – 692 scored against Cambridge University at Cambridge (Winch, 1997: 46).[11] Captain Murray Bisset, interviewed at Cardiff, described the tour as having successfully popularised cricket in South Africa, with his side improving immensely owing the experience gained:

> The thing which struck us more than anything else … is the solid, business-like way in which everybody settles down to make runs …another thing with which we have been greatly struck in England is the excellence of the umpiring. In South Africa we so often have to pick up any enthusiast who happens to be on the ground (MCC, 1901d: 306).

Despite the controversial timing of the tour, the players received lavish hospitality. There were race meetings, theatre, Henley boat races and many other diversions (Toms, 1997: 162). The first victory for the tourists was against the London County Cricket Club who fielded the likes of W.G. Grace and W.R. Murdoch (Hughes, 1989: 14).[12] The London Club marked the occasion by making the South Africans honorary members and entertaining them to an after-match dinner at the Crystal Palace (*Times*, 1901d: 12). Other such invitations were received from the MCC at Lords (MCC, 1901c: 1664) as well as the various counties.

Although the South Africans achieved a good proportion of victories, it cannot be said however that the team's presence in England meant much to the cricket public (Pardon, 1902: 466; Knowles, 1995: 37). Like other travelling teams in England, they were regarded not sufficiently near to the Australian standard to command attention, and their matches were merely viewed on a par with county cricket (Pardon, 1902: 466). Individually however the players did receive recognition. Kotze's fast bowling impressed whilst E.A. Halliwell's displays at wicket-keeper endeared him to the spectators (Knowles, 1995: 37). "The South African's have reason to congratulate themselves" was the cricket writer's response. Indeed the tourists had been strangers to turf wickets prior to the tour and were undoubtedly stronger at the end than at any other period (MCC, 1901e: 368). For J.D. Logan and his players the tour proved vital to the development of the game in South Africa. Not only had they raised the profile of South African cricket, but more importantly, they had managed to complete the tour against a backdrop of criticism from some of Britain's most influential voices.

THE CASE OF CONAN DOYLE

One of the most important propagandists opposed to W.T. Stead (Davey, 1978: 87)[13] and other anti-war voices in the media at the time was cricket enthusiast Arthur Conan Doyle. The creator of Sherlock Holmes is not however the first Victorian writer we associate with the promotion of the aims of Empire. Rudyard Kipling, with his South African association, and

[11] In an innings lasting five hours, Maitland Hathorn top scored with 239 – his country's first double-century abroad (see Winch, 1997: 46).

[12] This was the first victory by a South African side abroad in a first-class match (Hughes, 1989: 14).

Rider Haggard, come to mind more readily with their tales of adventure in India and Africa. Doyle's fiction is, however, often about war, and it is because he is concerned about war that Doyle becomes an important public figure in support of British imperialism at the turn of the century. According to Krebs:

> No British literary figure was as engaged with the fate of his country at the turn of the century as Doyle, who spent months fighting an enteric epidemic in a field hospital on the battle front and who would be credited with turning much foreign public opinion around on the question of British conduct in the war (Krebs, 1999: 85).

But rather than support for the policy of imperialism, it was Doyle's conception of the link between personal honour and national honour that pushed him into the role of public spokesperson for Britain. It was in this role, that he sparked the controversy surrounding the 1901 touring cricket team.

For serving his country through propagandising on its behalf during the Boer War, Doyle earned a Knighthood in 1902. Yet early in the war he had yearned for a more practical role as, at the age of forty, he had tried to enlist. After writing to *The Times* to suggest the use of mounted infantry, Doyle had felt "honour-bound to volunteer":

> What I feel is that I have perhaps the strongest influence over young men, especially young sporting men, of anyone in England bar Kipling. That being so, it is really important that I should give them a lead (quoted in Carr, 1949: 86).

He was not accepted into the military, but he was able to reach the fighting by another route. Resurrecting his dormant qualifications a physician, he went out to South Africa as senior surgeon of a hospital for British soldiers funded by a friend, John Longman (Krebs, 1999: 86).[14]

After Doyle's return to London in July 1900 (Marix Evans, 2000: 80), he remained deeply concerned about the war and the growth in anti-war propagandists, not least amongst elements of the foreign press. This began what Doyle called his "incursion into amateur diplomacy" (Doyle, 1906: 744), a stance that was to produce very public views on the things he cared about – not least cricket.

The 1901 South African tour to England took place in controversial circumstances. Lord Hawke's announcement of the tour in the *Times* during January of that year (*Times*, 1901a: 9) provoked a passioned response from elements of the public. G. Lacy of Sandgate felt compelled to write:

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[13] Anti-war propagandist and radical journalist W.T. Stead had been regarded as the "loudest voice in the pro-Boer movement" of the period (Davey, 1978: 87). An opponent of Doyle and an avid supporter of women's rights, Stead's anti-war work was a huge undertaking. *War Against War,* sixteen pages of newsprint, came out weekly from 20 October 1899 until 26 January 1900 and included regular articles from Stead as well as new summaries and transcripts of speeches about war issues.

[14] Conan Doyle had abandoned his practice when he became a literary success in the early 1890s (Krebs, 1999: 86).

> I observe that a team of cricketers is about to leave South Africa for this country. At a time like the present, with the call for young men to put an end to the deplorable state of affairs there, and when we ourselves are sending out the best of our manhood for that purpose, it is, to say the least of it, the most wretched of taste for these young men

> to leave it on a cricket tour. I trust the British public will take this view of the matter. Next year we should be delighted to see them, but today it seems quite monstrous (*Times*, 1901b: 10).

The Anglo-Boer War had not as yet ended and passions in Britain ran high. Doyle, himself a keen cricketer,[15] wrote the following letter which appeared in *The Spectator* on 20 April 1901:

> Sir, - It is announced that a South African cricket team is about to visit this country. The statement would be incredible were it not that the names are published, and the date of sailing fixed. It is to be earnestly hoped that such a team will meet a very cold reception in this country, and that English cricketers will refuse to meet them. When our young men are going from North to South to fight for the cause of South Africa, these South Africans are coming from South to North to play cricket. It is a stain on their man-hood that they are not out with rifles in their hands driving the invader from their country. They leave this to others while they play games. There may be some question even in England whether the national game has justified itself during this crisis, and whether cricketers have shown that they understood that the only excuse for a game is that it keeps a man fit for the serious duties of life. There can be no question, however, that this South African visit would be a scandal. I trust that even now it may be averted (*Spectator*, 1901: 565-566).

The letter provoked hearty agreement from the editor of *The Spectator*, who wrote:

> Unless there are some circumstances unknown to us which put an entirely different complexion on the proposal against which Dr. Doyle protests, we heartily endorse his protest … the time for South African cricket has not come yet. The men who held Wepener for the Empire showed us that the South African British could stand up to any team in the world in something much nobler and better than cricket (*Spectator*, 1901: 566).

The timing of the tour was unfortunate. When the tour had been arranged, it had not been anticipated that the war would drag on for so long. Pressure was also placed on the South Africans by the English cricket authorities who did not want their programme for the season disrupted by a cancellation (Kotze, 1915: 663). The players themselves were naturally sensitive to Conan Doyle's criticism. They pointed out to the press in their defence that eight of the 14 players had seen active service, whilst others had been members of various town

[15] Arthur Conan Doyle's single wicket in first-class cricket was that of W.G. Grace (Winch, 1997: 46).

defence forces (*Times*, 1901c: 9). Captain Murray Bisset himself had been a sergeant in a Cape Town Guard that became known as the 'Cricketer's Corps' because of the number of eminent sportsmen who made up the ranks (Creswicke, 1901: 141).[16] Whilst the Honourable J.D. Logan had also borne arms, and, as Captain of the Matjiesfontein Rifles, was present at the battle of Belmont (*Times*, 1901c: 9). The 1901 team's colours – red, blue and orange – were also deliberately identical to those of the South Africa War medal ribbon. The permission of General Sir Forestier Walker had been especially obtained in order that these

could be adopted (*Times*, 1901c: 9).

In an article for *The History of South African Cricket* published later in 1915, bowler J.J. Kotze wrote; "I wish Conan Doyle had done his fair share of fighting instead of starting a controversy in the press" (Kotze, 1915: 663). It was an unfortunate statement to have made considering Conan Doyle's contribution to the war effort, but one born out of the frustrations faced in embarking on the 1901 tour. Acting in the diplomatic role as team ambassador, Captain Murray Bisset attempted to explain the *raison détre* of the tour, upon its conclusion in August 1901:

> Two years ago Mr. Logan arranged with Lord Hawke for the tour of a South African team in England, but the war came and upset everything. Later, when Lord Roberts left South Africa and said that the war was practically at an end, Mr. Logan again arranged a tour. Then came the second invasion of the Cape Colony, and we did not know what to do. But most of the team volunteered for military duties and when the invasion was repelled, and everybody thought that there would be no more trouble, we promised to go with the team. All arrangements had been made in England for the tour, and we did not see how we could back out of it, especially as announcements were continually being made by the authorities, that the war, as a war, was over (MCC, 1900: 306).

The timing of the tour was not the only controversial aspect. The press also criticised the team because it was not a fully-fledged South African side. It was essentially a private venture organised by J.D. Logan, with the tour party largely representative of the Cape (Winch, 1997: 46; *Times*, 1901c: 9). It is significant to point out though that unlike the 1894 team, this side was granted first class status by the MCC (MCC, 1900: 1635; 1901a: 1641; 1901b: 1662). The team went on to win five and tie one of its fifteen first class matches. Had they begun the tour with minor matches in order that they could adjust to the turf wickets, they might have done even better. Five of the opening six first class matches were lost, a record that weighed heavily against the ultimate success of the tour (Winch, 1997: 46). The real significance of the 1901 tour lay, however, in the fact that it had been organised and played during one of the most tumultuous periods in South African history.

[16] Commanded by Lieutenant Feltham (late Protectorate Regiment), the 'Cricketer's Corps' were started with the aid of a £100 donation by Sir Abe Bailey for transport equipment. As well as Murray Bissett, other well known players in the Corps were: T.W. Bell, E. Yates, G. MacFarlane. J. Rushton, D. Howe, C. Bartlett, E. Warren, E. Gill, H. Wrensch, C.M. Neustetel, J. Graham, K. Hunter, F.R. Brooke, L.H. Fripp, W. Reid, H. Stidolph, S. Horwood, A. Baker, W. Marshant, J. Fehrsen, R. Solomon, I. Difford, H. Reid and L.J. Tancred. For an account of the Cape Town Guard see Creswicke (1901: 141).

POST WAR EMERGENCE

With the Anglo-Boer War over, and reasonable success against the visiting Australians two years previously (Coleman, 1928: 103),[17] a third tour of Britain was arranged in 1904. Frank Mitchell, the Yorkshire amateur who had stayed behind after Lord Hawke's tour, was chosen as captain, whilst Abe Bailey, the mining magnate and one of the founders of the Wanderer's Club guaranteed the tour's finances (*South Africa*, 1903: 796).

An ambitious programme saw the 1904 side equip themselves well, winning thirteen and losing only three of their twenty-six matches (Powell, 1994: 30). "Undoubtedly the present South African team is stronger than either of its predecessors" was the response of the MCC's *Cricket* journal on the tour's completion (MCC, 1904: 388). The South African's reward a year later was to receive Sir Pelham Warner and the first official MCC team to tour the sub continent. This was the series "that put South African cricket firmly on the map" as the Colonials went on to win the Test series by four games to one (Reader's Digest, 1981: 240). The MCC had clearly underestimated the strength of the South African national side. Despite its troubled past, South Africa had at last arrived in international cricket.

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THE RATIONALE FOR THE MULTIFACETED DEVELOPMENT OF THE ATHLETE-STUDENT IN THE AFRICAN CONTEXT

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ABSTRACT

In the high profile competitive world of global sport, the athlete is from a relatively young age under exorbitant pressure to excel, compete successfully in the international arena and develop as a person and professionally. The South African athlete faces unique challenges in this regard and requires special nurturing and development to achieve personal, professional and sports-related success. This paper explores the unique social and competitive world of the athlete by analyzing data obtained from a survey conducted among elite athletes who participated in the 7th All Africa Games in 1999. The data focuses on the social profile of the athletes and was obtained through 103 interviews (8 heads of missions, 11 managers, 17 coaches and 67 athletes) and questionnaires that were completed by 343 athletes (160 men and 113 women). They represented 20 different sporting codes, were from 97 different urban and/or rural communities and represented a wide socio-economic, ethnic, age and educational spectrum. The findings informed the proposed rationale for a multi-level and -faceted development programme for the athlete-students. Educational institutions, national sports agencies, companies and athletes may tap into these research findings and this rationale to address the development of South African athletes and sport meaningfully, ethically and responsibly.

Key words: Elite athlete; African athlete; Career phases; Retirement.

INTRODUCTION

Some of the major forces in the world of contemporary elite sport relate to the economic and political power structures and relationships. Celebrating the values of excellence and competition in elite sport, successful athletes and teams receive the adulation of being national heroes and superstars (Sanders, 2000). They often fulfil the aspirations of acclaimed nationhood, bringing the gold medals to their countries and instilling pride in people who, by association, experience a surge in their self-worth and national pride. International super stars such as Pele became the symbol of Brazil's sporting prowess and the long line of Kenian runners who have dominated world distance running are celebrated as capturing the spirit of the nation (Allison, 2001). When the "Amabokoboko" (Springboks) won the 1995 Rugby World Cup and the Bafana Bafana the 1996 African Cup of Nations, politicians used the forum to address nation-building and supporters experienced feelings of national pride and belonging of the majority of South Africans (Booth, 1996).

Another major force influencing the world of sport is commercialisation. Professional sport has at different levels of professionalism become a lucrative career for the fortunate few whose upward social mobility is also evidenced in often exorbitant appearance fees, endorsement and player contracts (Lavoie, 2001). Professional athletes have become sports workers with a relatively short playing career. They have become commodities to be bought or sold in accordance with market forces and their own marketability (Coakley, 2001). Many top-level players who had obtained contracts to play overseas did so to maximise their earnings as 'migrant workers' and to extend their sporting careers. David Bechkham who earns about R109 million yearly at the age of 27, and South Africa's soccer star, Lucas Radebe as a contracted player of Leeds United (since 1994) has been earning about R187 million yearly through contracts, bonuses, sponsorships and endorsements, are but two of the 'success stories' of sport (Griffiths, 1999; Adamson, 2002).

Transnational companies and media networks have tapped into the highly visible and

persuasive world of elite sport by successfully branding athletes with products to enhance their consumer profiles and maximise their profits (Giddens, 2000; Coakley, 2001). As Carl Lewis explained when he raced against Linford Christie in 1993 and their respective sponsors put up 100 000 pounds in prize money: "I'm a company, he's a company. The idea is for my company to outperform his company" (Lynam & Teasdale, 1994: 33).

Cross-cultural and interdisciplinary studies as well as governmental task teams have investigated the complex process of the athletic achievements of different nations and developed benchmarks from the most successful nations and teams (Gould *et al.*, 1999). The quality of scientific support and resources is perceived to be the basis of athletic success (Stamm & Lamprecht, 2001). It accentuates the economic inequalities as first-world countries have always won the overall medal counts.

With these major forces at play, individual athletes have to negotiate a career and find ways to invest in their personal future, which will enable them to have a career once their active playing days are over. Insight into the socialisation process may provide them and the academic fraternity involved in assisting them to meet this challenge, with some answers.

THE PREMISE AND PARADIGM

The Marxist paradigm provides a framework for analysing the exploitative and stratified structuring of elite sport and the power play within commercial sport with its roots in the media and corporate enterprise (Rigauer, 2001). Political power and the acclaim of sport in terms of nationhood can be conceptualised critically in terms of Gramsci's analysis of hegemonic power relations (Hargreaves & McDonald, 2001). The macro theoretical perspective may however, contribute to the understanding of the contextual factors influencing the lives of elite athletes.

Moving to postmodernism and interpretative sociology, Prus's model of 'career contingencies', which is grounded in the interactionist view of social behaviour, offers explanations of the identity formation (social and personal), and the processes of socialisation and desocialisation of the elite athlete within his/her social position (Prus & Irini, 1980; Stevenson, 1999). Descriptions and analyses of sports subcultures and the process of socialisation that provide insights into the themes of sporting careers, subcultures and cultural production will be utilised in the micro-analysis of data (Donnely, 2001).

SOCIALISATION OF THE ELITE ATHLETE

Prus and Irini (1980) identify various phases in being socialised into and through sport that entails introduction, recruitment, deepening involvement, entanglement, commitment and obligation. This analysis corresponds with the career phases identified by Bloom and adapted by Salema (1994) who conceptualised and integrated the behaviour of performers and significant others (performer and mentors) in their typologies. The significance of socialisation as a reciprocal process between the athlete and the significant other is widely recognised (Coakley, 2001). Insofar as human agency demonstrates the social construction of reality, it sheds light on the fact that humans interact to accept or reject certain norms and behaviours and are thus actively making choices that are influenced by culture (including subcultures), their environment and significant others as major 'socialisers'.

During the formative years and initiation phase of becoming an athlete, parents are mainly sought mentors who share the positive excitement of their children being actively involved in

sport and often make significant sacrifices in providing resources and support in order to 'launch their children's sporting careers'. During the mastery phase, parents tend to play a lesser role although emotional and practical support remain to a large extent the prerogative of the family and friends (Johnston & Carroll, 1998). The influence of coaches has proved to become more important as athletes progress in their athletic careers. Insofar as these factors can contribute to sporting success, they can also contribute to withdrawal and burnout. The over-involvement and unrealistic expectations of parents and coaches identified as the 'reversed-dependency trap', where an adult identifies with a child to the extent that his or her self-worth depends upon the success of the child, often contribute to competitive anxiety, decreased enjoyment and guilt that may lead to dropping out of sport (Coakley, 1993; Wiersma, 2000).

Whereas the family or household provides experiences and values for learned interpersonal relationships and normative behaviour, the peer group is an equally powerful source of ideas and experiences during the teen years (Hardman, 1997). Team members, in particular, are important influences in the lives of athletes who are subjected to long hours of training, travelling and competing. Social identity formation, team cohesion, inter-group harmony, co-operation and a shared commitment are strong motivators for group success, team-building and social bonding during the phase of 'deepening commitment' (Prus & Irini, 1980; Widmeyer *et al.*, 1993).

Environmental factors that are of relevance at his stage relate to the compatibility of dominant value systems of competitive sport with personal and social lifestyles, a favourable sports culture, club environment (support and long term- positive athlete-coach relationships), athletic success during adolescence, multi-sport involvement during childhood, early maturation, being born early in the year and hereditary factors ('the right genes') (Carlson, 1993).

Lee *et al.* (1990) report the influence of similar socio-environmental factors in their study of the 'social role-social system' of Korean medallists in the 1988 Seoul Olympics. As a dialectical process, socialisation is problematic - despite the fact that people demonstrate agency (i.e. abilities, power to act), the conditions for the agency are rarely ones of the agent's own choosing (Lawson & Stroot, 1993). Political ends are often served by coercing athletes

to take part in national competitions, using them as 'political ambassadors' for propaganda purposes. Economic exploitation is also evident in the buying and selling of athletes or teams, controlling endorsement, biased contracting, unethical labour practices and the spread of consumerism through media profiling and sponsorship (Coakley, 2001). If athletes have outlived their usefulness or are no longer 'marketable' they are often left alone to cope with the downward spiral retirement.

Research on the retirement experience of Olympic athletes suggests that the majority (up to 80%) report difficulty in making the transition out of active sports competition (Petitpas *et al.*, 1992). Research findings and analytical models reflect on the trauma, loss of status, financial difficulties, drug abuse, identity crisis, isolation and sometimes grieving process of transition (Greendorfer & Blinde, 1985). Training and sport performance are central in the lives of athletes and have strong ties to their self-identity, self-worth and value system of being an elite athlete (Balague, 1999).

The experience of 'social death' upon retirement is closely linked to factors such as a narrow

focus of self-identity (as athlete), loss of control over the decision to retire, loss of status and social identity, the lack of a social support system and inadequate pre-retirement planning (Ogilvie & Taylor, 1993). Elite athletes who are professionally qualified have some form of sheltered employment, or are in the position to acquire a high profile career outside that of a professional player, may experience a 'relief rather than a crisis' (Sinclair & Orlick, 1994). Still, the majority of elite athletes are still exposed to 'social death' rather than 'social rebirth'.

To address this dilemma and exploitative sporting practices, anecdotal evidence should be replaced with cross-cultural in-depth research that will optimally drive the holistic life span development and nurturing of elite athletes as athletes and valuable human resources. Sports agencies (such as the National Olympic Committees) and educational institutions have responded to this dilemma by developing career assistance or institutionalized programmes and/or scholarships (Riffee & Alexander, 1991; Petitpas *et al*., 1992; Brown & Bohac, 1997). By tapping into these frameworks and conducting cross-cultural research into the sociological profiles and identity formation of African athletes, much needed insights are generated to inform a pragmatic developmental perspective.

The aim of this research focused on identifying the socio-psychological profiles of elite athletes and collect data on the processes of socialisation, identity formation and supportive systems that offer insight into lived experiences and the needs of these athletes. In part, this paper draws on the backgrounds, perceptions and experiences of national and/or international African athletes. It is thus structured firstly to explore the political and economic forces within elite sport, followed by the viewing of the process of socialisation, identity formation and the lived realities of African athletes to substantiate the need and rationale for multifaceted nurturing as part of a holistic identity formation as well as life- and career-oriented development.

THE METHOD

By reporting and interpreting data collected from 410 athletes from 22 African countries, 343 of whom completed questionnaires and 67 of whom were interviewed, insight is created into the lived realities of these athletes from developing countries. The sample of the athletes included men (63%) and women (37%), representing all 20 sports of the 7th All Africa Games. Selecting a randomised and fully representative sample was problematic due to the limited availability of athletes during the Games and the limited research funding that did not allow for extensive travelling, post-Games follow-ups and translation services.

Due to the exploratory nature of the research, collective comprehensive data was prioritised and a judgement sample was selected. Triangulation of data was the result of multiple researchers and methods (questionnaire and interviews). The interviews lasted from 40 to about 90 minutes and were taped and transcribed. The narratives were coded for analysis.

THE AFRICAN ATHLETE: RESULTS

Socio-economic profile

The data obtained from African athletes who participated in the 7th All Africa Games demonstrates clearly that the lack of resources and economic profile impact negatively on athletic careers. The majority of the athletes (84%) were from urban areas in their countries

where there are facilities or where the training centres are relatively better equipped and coaches are more readily available than in the relatively rural areas. A coach and athletes explain their situations in this regard:

> "Unfortunately we do not have much in terms of financial backing. Whenever we play whether it be in the local league or the provincial tournaments or national tournaments, we always have to hand money out of our own pockets. This year, where I've been playing for many years, it is the first year ever that we've actually had a training camp for more than a couple of days' duration prior to a major competition."
> (A volleyball player from South Africa)

> "I am worried to run as I don't have shoes. I will have to borrow from the other athletes. There is no sponsorship for this."
> (An athlete from Nigeria)

> "We do not always have equipment, especially gloves. The boxers punch with motor car tyres and fasten papers like gloves."
> (A coach from Tanzania)

Competing in sport requires financial means and resources for which families and/or households have to bear the largest portion. It is tough for a poor household to support an athlete, a scenario that is reflected by the socio-economic status of the majority of African athletes being from a high- (7%) and middle-income bracket (60%) compared to 21% indicating that they fall into a low-income bracket or are poor (10%). This class distinction is even more prevalent in the educational status of the athletes and/or their parents have a small percentage of the athletes and both of their parents or guardians having secondary (15%) or tertiary education (13%).

Socio-economic groups also seem to differ as far as the type of sport in which they participate. Unfortunately, the chi-square approximation may not hold, due to small frequencies, but it seems that athletes from the lower socio-economic strata represent sports such as handball (64%), soccer (56%), athletics (48%), weightlifting (39%) and volleyball (38%). The access to practice time was also influenced by the socio-economic status of the athletes.

A cross-tabulation of off-season and competitive season practice times shows that there is a significant difference between off and competitive season training times (Chi-square value=99.789; p-value=0.000 <0.01). As training peaks during the competitive season, athletes from poor socio-economic households tend to practise only 5-10 hours per week (40%) in comparison with athletes of a middle (33%) and higher economic status (40%) who train for more than 21 hours per week during the competitive season.

Unequal access to resources is even more evident among athletes from developing countries and first-world countries. Athletes from African countries perceive themselves as being relatively disadvantaged and lagging behind their European and/or American counterparts, particularly in terms of scientific support, preparation and support for international competitions. The majority of African athletes perceive the lack of financial support (91%), scientific assistance (82%), training and competitive opportunities (80%), expert coaching (63%) and social support (56%) as stumbling blocks in their athletic careers.

These perceptions are substantiated by the fact that only a small percentage (13%) indicated that they were professional athletes or partially (21%) earned a living through sport. The majority (59%) who are neither students nor at school (13%) are otherwise employed in the formal or informal sector. Not being able to sustain a professional career in sport, elite athletes are carrying a double burden of supporting themselves and their athletic careers through other part- or full-time occupations and having little time for anything beside competing and training. This taxing lifestyle takes its toll on relationships as well as the physical and psychological health of athletes whose sports participation has in some cases taken over their entire existence. An athlete from Mauritius explains:

> "My biggest frustration as an athlete is the long working hours. I work as a lab assistant for ten hours per day. During the off-season I can train for two hours per evening. During the competition season I train more and only take the weekends off."

Sports-related injuries contribute to the financial, psychological and physical stress of athletes because injuries may end their sporting careers. Not being in a peak physical condition may cause them to lose a championship or sponsorship, or be dropped from a team. Some athletes explain their anxiety and consequences of being injured.

> "I had an injury to my hamstrings and was eliminated in the semi's because of the injury. An injury makes you nervous and demoralises you."
> (An athlete from Kenia)

Socio-political aspects

Against the background of relative deprivation, governmental institutions and sports bodies have a vital role to play in providing much needed support and resources as secured employment in the civil service is diminishing. Political agencies require athletes to be

ambassadors and role models conveying messages of nation-building and ideological superiority, and evoking national sentiments and pride through association. The perceived unique identity of African athletes embraces such national sentiments, which is expressed by several national athletes as follows:

> "Being an elite (sportsman) is very important because you are recognised and people give (you) respect. You are competing for your country and your people."
> (A volleyball player from Zambia)

In spite of the emphasis on talent identification and sports development in African countries, only 48% of the athletes indicated that coaches and/or institutions such as the school, local or regional sports club or tertiary institution had recruited them. An even smaller percentage (33%) viewed themselves as products of governmentally sponsored development programmes. This reflects on the absence or inadequate functioning of such programmes on the one hand, and the comprehensive support structures and support needed for sustaining elite sports participation.

The implementation of policy and other political power imbalances are manifested in diverse discriminatory practices such as controlling funding and/or access to election and/or

favouritism based on majority status, ethnicity, gender, the status of a sport, and the age and locality of athletes. Several white South African athletes felt themselves relatively powerless as racial quotas have at some stages excluded them from participation, whereas athletes of colour perceived themselves as being economically disadvantaged. Patterns of social stratification were most evident among women athletes, and athletes from an ethnic minority, from certain nationalities or from the lower socio-economic strata in a society. Some athletes competing in karate, boxing and Taekwondo cited incidents in which they felt cheated by judges who favoured 'bigger names' or athletes from their own countries. Kenyan athletes experienced some animosity if they won races in the Grand Prix Series in European countries where sponsors and supporters would prefer one of their own to have won.

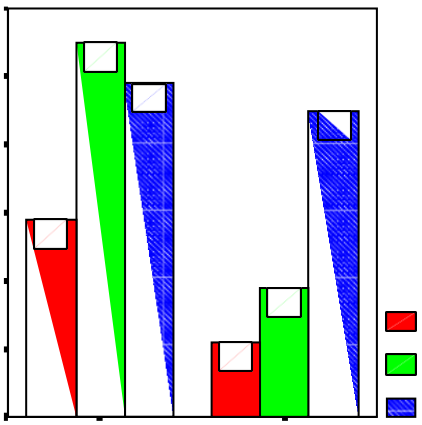
Socialisation

The life cycle of the athlete in most of the sporting codes is relatively short. The fact that it takes about 10 years of competitive participation to reach an elite level and given the mean age of 25.7 years of the sample illustrate the intensive engagement and influence on the identity formation of athletes from a relatively young age.

The social structure and presence of other siblings are more important, for only 14 athletes (4%) who completed questionnaires indicated that they were the only children. The largest number of athletes appears to be the youngest sibling (43%), followed by a middle child (35%) or eldest (22%). This picture changes when considering the gender of the athlete and the position within the family. It is clear that the majority of women athletes are the youngest of the siblings whereas the majority of male athletes are middle children (see Figure 1).

The importance of family members, parents, coaches (significant others) and friends (peer group) as 'socialisers' is evident in the athletes who indicate them as being the main providers of psychological support and influential people in their sports careers. Family members are

viewed as the most influential socialisation agents (n=210), followed by a coach or mentor (n=111) and friends or peers (n=99). The relationship with friends seems to be more vulnerable and most affected by the athletes' competitive participation. Eighty-four athletes indicate that their relationship with friends and/or love affairs had deteriorated due to the demands (time and emotional) of travelling, training and competitions.



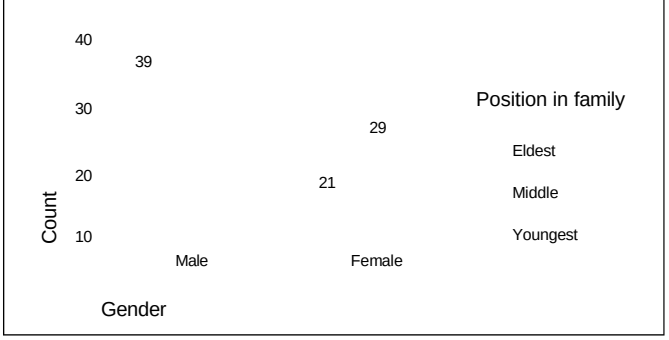


FIGURE 1. **GENDER AND POSITION OF ATHLETE IN THE FAMILY STRUCTURE**

Bonding with significant others seems to be strengthened during what Prus and Irini (1980) refer to as the introductory and deepening involvement phase of becoming an athlete. As a process of enculturation takes place and the athlete finds an appropriate place and status within the hierarchy of sport, new friendships are formed with team members and fellow athletes. Athletes develop a deep-seated desire to succeed and conform to the norms and behaviour conducive to their strife for distinction. This often becomes the overall purpose in their lives as they are recognised as being one of 'them' (elite athlete fraternity).

Between the initial and 'conversion' phase of becoming an elite athlete, a shift in motivation and behaviour takes place. Where intrinsic enjoyment, success, talent, the attractiveness of the sport and significant others were identified as prime introductory motivators, intrinsic and personal rewards, success, status and external rewards were identified as prime motivators for wanting to be an elite athlete (see Figure 2).

There seems to be a shift in focus as the sportsperson becomes more entangled in his/her role as an elite athlete. The personal growth, values, sacrifices and identity of being a committed athlete, hard work, sacrifice and sporting success are embraced and valued as meaningful and directive in pursuing a career in sport (see Figure 3).

In becoming an established part of the group of insiders (other elite athletes or a team), the individual's involvement deepens and he/she achieves some form of valued social identity in the sporting contexts with stronger commitments and self-identification of being an elite athlete – a reputation attributed by others as well.

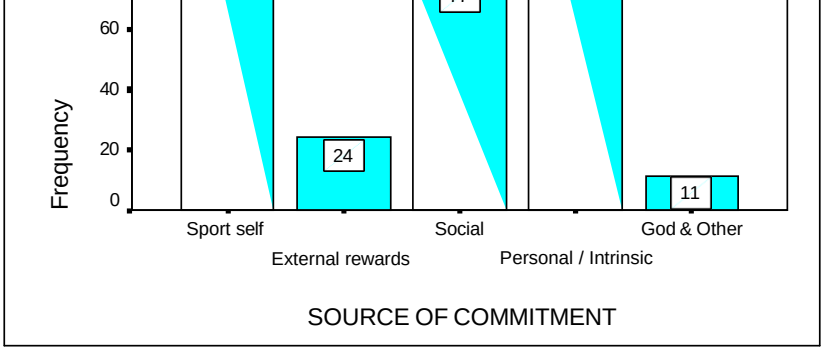


FIGURE 2. **FREQUENCIES OF SOURCE OF COMMITMENT OF ATHLETES**

Personal and intrinsic meanings are viewed as important gains, as well as external rewards, social status and recognition despite the perceived lack of being successful at international level. It is however the love of, and commitment to, the sport, the intrinsic rewards and social status that primarily motivate athletes to remain involved and committed to train and compete at an elite level. In the end however, the main ambition is the quest for sporting success that is perceived to be the main source of the athlete's motivation. Several athletes commended on, and explained their dedication and often extreme commitment to their sports and their strife for excellence, success and recognition as follows:

> "The most rewarding experience for me as an athlete is really winning. I was so happy to have won the World Junior title last year. In fact, I felt like crying when the national anthem was played. Everywhere you go around in Nigeria you're known. This motivates you to stay there."
> (An athlete from Nigeria)

> "What keeps me going is the quest for personal growth and development. I also would like to better myself (in sport) all the time."
> (An athlete from Cape Verde Islands)

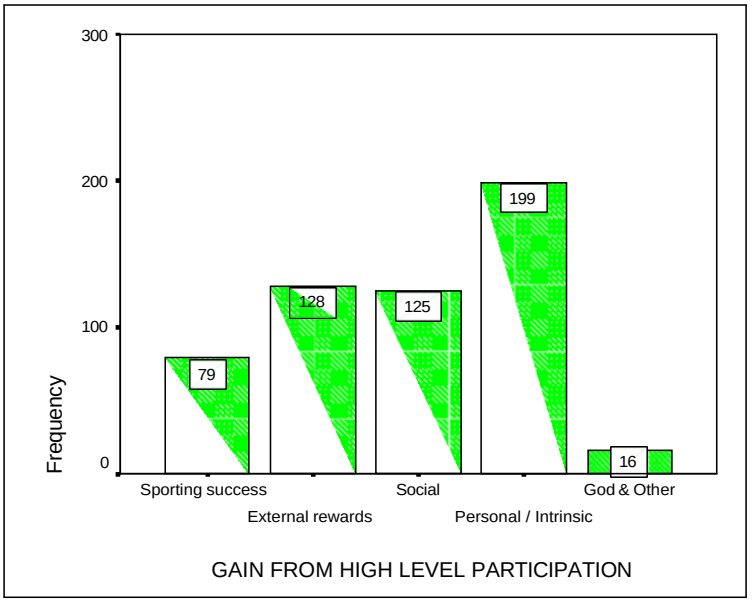


FIGURE 3. **GAINS OF ATHLETES FROM HIGH LEVEL PARTICIPATION**

This complete commitment and engulfment of a sporting career have in theory and practice overshadowed the inevitable reality of retirement from sport. When the athletes were asked to

reflect on their possible retirement, the majority (46%) indicated that they wanted to become a coach or follow a sports-related career (14%). Twenty-five athletes were uncertain as they had not given retirement from high performance sport much thought and 44 (12%) only indicated that they would continue their sports participation at recreational and social levels. Only 45 (12%) indicated that they had career plans other than being directly involved in sport. It is clear that career development has taken the back seat in the development and nurturing of elite athletes. This is most evident in the athletes' admittance that, above all, they had sacrificed their education and preparation for a career in becoming and being an elite athlete.

> "I don't have a personal life. It is only training and competing. I have to sacrifice everything … Even my friends do not understand. We (athletes) are quite isolated."
> (An athlete from Namibia)

> "I never had a normal childhood because of football. I always had to train to become the best player. I do sport all the time. This is my life."
> (An athlete from South Africa)

We do not always realise how fragile and demanding a sporting career is. A national athlete who participated at the 7th All Africa Games captured the intense and fleeting existence thereof by saying: "Sport takes a lot of sacrificing. You have to cope with injury, jealousy, failure, politics, relationships and being away from home. It's tough out there, and then it is over before you are ready for it to end."

Educators and academics need to contribute meaningfully to the nurturing of athlete students and provide the essential resources firstly to equip them to meet the competitive demands of high performance sport, and secondly to develop life and career-related skills. The aspect of social care and assistance with the professional integration during and after the athlete's career need to form part of a comprehensive development strategy. Educational institutions, private enterprises and political stakeholders should be informed to come on board to facilitate sports development optimally and the multifaceted development of elite athletes.

CONCLUSION

The sports fraternity needs a rude awakening of what it takes to be an athlete. How much is an athlete's life worth? All role players are ethically bound and responsible to assist in the development of athletes as competitors, students and citizens who often light the flame of hope and glory in which everybody so readily shares. The quest for the athletes and all stakeholders is to team up and face the responsibility together.

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GESONDHEIDSRISIKOGEDRAG BY ADOLESSENTE VAN VERSKILLENDE OUDERDOMME

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ABSTRACT

This study investigated the health risk behaviours of adolescents from selected schools in Potchefstroom, in the North West Province of South Africa, with the emphasis on age variation. The Youth Risk Behaviour Survey (YRBS) was administered to 323 high school pupils between the ages of 13 and 18 years (141 boys and 182 girls). The age variation was: 13 years (8%), 14 years (18%), 15 years (19%), 16 years (20%), 17 years (17%), 18 and older (18%). Ethnic variation was 32% black, 30% white, 27% Coloured and 11% Indian high school pupils. The Youth Risk Behaviour Survey (YRBS) monitors six categories of priority risk behaviours among youth and young adults: behaviours that contribute to unintentional and intentional injuries, tobacco use, alcohol and other drug use, sexual behaviours, dietary behaviours and physical activity. The section on dietary behaviours was not included in this study. Results of this study indicated that there are many high school pupils in Potchefstroom who practice behaviours that place them at risk for serious health problems from the age of 13 years. A higher frequency of risk behaviours were found with older adolescents. Statistical differences within the age variation were found in violence, alcohol, marijuana use and sexual activity.

Key words: Health risk behaviour; Adolescents; Violence; Substance; Sexual

activity; Physical activity.

INLEIDING

Adolessensie word dikwels gesien as ’n tydperk van optimale gesondheid, lae mortaliteitsvlakke, lae voorkoms van siektetoestande, relatief lae vlakke van liggaamsgebreke en chroniese siektetoestande (Millstein *et al.,* 1992). Daar is egter toenemend kommer oor die gesondheidstatus van die hedendaagse jeug vanweë die groter blootstelling en deelname aan risikogedrag. Eksperimentering en meedoen aan risikogedrag word egter dikwels gesien as deel van die normale ontwikkelingsproses tot volwassenheid (Igra & Irwin, 1996).

Gesondheidsrisikogedrag is gedragsaktiwiteite wat ’n persoon se gesondheid en welstand kan benadeel (Zweig *et al.,* 2001). Volgens Jessor (1991) verwys risikogedrag ook na enige gedrag wat die psigososiale ontwikkeling van die adolessent kan rem. Gesondheidsrisikogedrag wat bydra tot die hoofoorsake van mortaliteit en morbiditeit by adolessente en volwassenes, ontstaan dikwels gedurende die adolessente jare (Kann *et al.,* 1998). Namate adolessente na onafhanklikheid beweeg, word hulle dikwels blootgestel aan gedragsaktiwiteite wat die kanse op beserings en siektetoestande kan verhoog. Adolessente wat vanaf ’n vroeë ouderdom deelneem aan gesondheidsrisikogedrag soos byvoorbeeld om van jongs af te rook, te drink en seksueel aktief te wees, toon gewoonlik ’n swakker

gesondheidsprofiel as hul eweknieë wanneer hulle ouer word. Hierdie persone het dikwels ook ’n laer skoling en is minder ekonomies produktief (Warren *et al.,* 1997). Vroeë inisiëring van gesondheidsrisikogedrag word geassosieer met ’n langer periode van deelname aan risikogedrag in die laat- adolessensie- en jong volwasse jare (Mott & Haurin, 1988).

Jesser (1991) het ook gevind dat wanneer adolessente op ’n vroeë ouderdom aan een gesondheidsrisikogedrag begin deelneem, dit dikwels lei tot deelname aan ander risikogedrag. Ander studies het soortgelyk gerapporteer dat vroeë deelname aan risikogedragsaktiwiteite soos dwelms en alkohol tot deelname aan ander risikogedragsaktiwiteite lei (Dryfoos, 1990; Warren *et al.,* 1997). Jesser *et al.* (1991) maak die stelling dat probleemgedrag by adolessente voorkom omrede die sosiale ekologie rondom die adolessent situasies skep vir eksperimentering. Du Randt *et al.* (1999) is van mening dat gesondheidsrisikogedrag en probleemgedrag saam voorkom omdat albei ’n rol speel by die sosiale en psigologiese ontwikkelingsfunksies soos byvoorbeeld risikogedrag as pogings om volwasse status te bereik en vir goedkeuring en aanvaarding deur die portuurgroep. Volgens Jessor (1991) ontwikkel sommige adolessente ’n risikogedragsindroom wat veroorsaak word deur blootstelling aan die algemene latente veranderlikes van die onkonvensionele in kombinasie met blootstelling aan risikogedrag. Die graad van saamgroepering hang af van die adolessent se blootstelling aan meervoudige risikodomeine binne vyf breë areas: geneties, omgewing, sosiaal, persoonlikheid en gedrag (Jesser *et al*., 1991). Volgens Jesser (1991) is hierdie saambestaan of saamgroepering sterker vir risikogedrag wat ook probleemgedrag is, byvoorbeeld dwelms, alkoholmisbruik en hoërisiko seksuele gedrag. Vroeëre navorsing van Jessor en Jessor (1977) het byvoorbeeld gevind dat 61% van die marijuanagebruikers seksueel eksperimenteer, teenoor die 18% van nie-gebruikers. Die saambestaan van nie-probleemgedrag soos byvoorbeeld onaktiwiteit en swak dieët kom minder algemeen voor.

In 1998 het die “Centers of Disease Control and Prevention” (CDC) in die Verenigde State van Amerika die “Youth Risk Behaviour Surveillance System” (YRBSS) ontwikkel om aktiwiteite wat die gesondheid bedreig, te identifiseer en tweejaarliks te monitor. Hiervolgens

is die volgende risikogedragskomponente geïdentifiseer: a) gedrag wat kan lei tot onopsetlike en opsetlike beserings, b) rook, c) alkohol en dwelmgebruik, d) seksuele gedrag wat lei tot onbeplande swangerskap en seksueel oordraagbare siektes, e) ongesonde eetgewoontes en f) onaktiwiteit. Hierdie gesondheidsrisikogedrag, wat dikwels onderling met mekaar verband hou, word dikwels tydens adolessensie gevestig en voortgesit in die volwasse lewe (Kann *et al.*, 1995).

Die doel van hierdie studie was gevolglik om met behulp van die "Youth Risk Behaviour Survey" (YRBS), tendense van gesondheidsrisikogedrag van adolessente van verskillende ouderdomme te bepaal, aangesien daar nog nie Suid-Afrikaanse norme hieroor bestaan nie.

METODE VAN ONDERSOEK

Die vraelysondersoek is afgeneem in ses verskillende skole in Potchefstroom in die Noordwesprovinsie. Die vyf gesondheidsrisikogedragkomponente van die YRBS (Centers for Disease Control and Prevention, 1999) wat in hierdie ondersoek geëvalueer is, is intensionele beserings (geweld, dra van 'n vuurwapen en selfmoord), rook, alkohol- en dwelmgebruik, hoërisiko seksuele gedrag en fisieke onaktiwiteit. Die vraelys is in Afrikaans vertaal. Om die geldigheid en betroubaarheid van die vraelys te bepaal, is die Engelse en Afrikaanse vraelyste

aan twee-en-sestig 14- tot 18-jarige adolessente gegee om in te vul. Die vrae is maklik verstaan, en daar is bepaal dat die vraelys toets wat dit veronderstel was om te toets. Die toets-hertoets-betroubaarheid van die vraelys is agt weke later bepaal volgens die Chronbach Alfa toets (0.79) en die meetinstrument is as 'n geldige en betroubare meetinstrument bevind ten einde gesondheidsrisikogedrag te evalueer.

Die proefgroep het bestaan uit 323 leerlinge tussen die ouderdomme 13 tot 18 jaar. Hiervan was 141 seuns en 182 dogters. Die ouderdomsverspreiding van die groep was soos volg: 13 jaar (n=25 (7.12%)), 14 jaar (n=58, 19.96%)), 15 jaar (n=61, 18.89%)), 16 jaar (n=65 (20.12%)), 17 jaar (n=57 (17.56%)), 18 jaar (n=45 (13.93%) en ouer as 18 (n=14 (4.33%). Die etniese samestelling was soos volg: blankes (30%), swartes (32%), kleurlinge (27%) en Indiërs (11%). Die YRBS-vraelys is 'n self-rapporterende vraelys en is eenmalig gedurende skoolure in die verskillende skole afgeneem. Ingeligte toestemming is vooraf van die ouers verkry. Deelname aan die vraelysondersoek was vrywillig en anoniem.

Die data is verwerk met SAS (SAS, 2000), en frekwensieverspreiding van elke item per jaargroep, is bereken. Tweerigtingtabelle en die chi-square-analiseS is uitgevoer om die betekenisvolheid van die verskille tussen die onderskeie ouderdomme te bepaal (Steyn, 1999).

RESULTATE EN BESPREKING

In Tabel 1 word die frekwensie van deelname aan die risikogedrag "intensionele beserings" wat die dra van 'n wapen, geweld en selfmoord insluit, volgens ouderdom voorgestel.

TABEL 1. **FREKWENSIEVERSPREIDING: VOORKOMS VAN GEWELD, DRA VAN 'N WAPEN EN SELFMOORD VOLGENS OUDERDOMME**

Gesondheidsrisikogedrag: Dra van wapens, geweld en selfmoord	**% 13 jaar**	**% 14 jaar**	**% 15 jaar**	**% 16 jaar**	**% 17 jaar**	**% 18 jaar**	**p**

Dra van ’n wapen	4.35	18.18	11.48	12.31	23.21	11.63	0.083
Dra wapen op skoolgrond	4.34	3.64	1.64	6.15	7.27	4.65	0.762
Voel onveilig by skool	4.35	3.64	1.64	6.15	5.36	4.65	0.002*
Met ’n wapen gedreig by skool	4.35	16.36	14.75	13.85	8.93	6.98	0.607
In fisieke geveg betrokke	26.09	29.09	31.67	41.07	26.19	14.29	0.467
Deur vriend/vriendin geklap, geslaan of doelbewus seergemaak	0	18.52	13.33	10.04	18.52	16.67	0.345
Gedwing om seks te hê	4.35	5.45	10.17	4.62	3.70	4.65	0.227
Oorweeg om selfmoord te pleeg	3.40	18.18	24.59	21.54	22.22	20.93	0.587
Selfmoord beplan	0	5.56	16.39	18.46	22.37	18.60	0.099
Probeer selfmoord pleeg	0	5.40	9.84	12.31	20.37	13.95	0.135

* $p<0.05$ ** $p<0.01$

By die meerderheid items was daar nie groot verskil in die risikogedrag van adolessente van verskillende jare nie. By die meeste van die items is ’n stygende lyn in die risikogedrag vanaf 13 tot 18 jaar merkbaar. Die grootste frekwensie deelname aan risikogedrag blyk vanaf 16 tot 18 jaar te wees. Die enigste statisties betekenisvolle verskil wat tussen die deelname aan bogenoemde risikogedrag by die onderskeie ouderdomme voorgekom het, was by die vraag “of die leerlinge onveilig voel by die skool” ($p=0.002$). By die ander vraelysitems was daar nie statisties betekenisvolle verskille tussen die riskikogedrag van adolessente van verskillende ouderdom nie.

Dit is opmerklik dat by die 14- tot 16-jarige adolessent daar ’n groot mate van deelname by die “dra van ’n wapen en om met ’n wapen gedreig te word” was. Dit wil dus voorkom asof hierdie ouderdomsgroep nog eksperimenteer met die dra van wapens en mekaar dus daarmee dreig. Hiermee saam lyk dit asof die ouer leerlinge wel in ’n groter mate wapens dra, maar minder bedreig is daardeur. Tot op 16 jaar is adolessente meer betrokke by fisieke gevegte, waarna dit weer afneem vanaf 17 tot 18 jaar. Dit is onrusbarend dat daar by al die ouderdomsgroepe, uitgesluit die 13-jariges gerapporteer word dat hulle deur hul vriend/vriendin geklap, geslaan of seergemaak word. Hiermee saam is dit ook ontstellend dat daar adolessente is van al die jaargroepe wat al gedwing is om seksuele omgang te hê teen hulle sin. By al die ouderdomsgroepe is ook gerapporteer dat daar adolessente was wat al probeer selfmoord pleeg het, met die grootste persentasie by die 17-jarige adolessent. Alkohol word volgens die studie van Anteghini *et al.*, (2001) met 50% van selfmoorde geassosieer. Ander faktore wat met selfmoord geassosieer word, is die dra van wapens, wapens in die huis, dwelms en seksuele teistering.

Die resultate van hierdie studie oor die dra van wapens, geweld en selfmoord, is ’n weerspieëling van die geweld in Suid-Afrika. Dit is ’n bekende feit dat Suid-Afrika een van die gewelddadigste gemeenskappe in die wêreld is, met kinders die slagoffers en getuies van geweld (Pelser & de Kock, 2000). In die resente studie van Jansen van Rensburg (2001) waar gekyk is na blootstelling aan geweld en die voorkoms van depressiesimptome by kinders in die Noordwesprovinsie in Suid-Afrika, is gevind dat die oorgrote meerdereid van die leerlinge aangedui het dat hulle aan statisties beduidende hoë vlakke van geweld blootgestel is, veral

geweld binne die gemeenskap. Kinders wat aan geweld blootgestel is, het statisties beduidende hoër vlakke van depressie ervaar. In Amerika is selfmoord die derde grootste rede vir sterftes by 15-19-jarige adolessente (Borowsky *et al*., 2001).

In ’n ongepubliseerde studie van Coetzee & Spamer (2002) waar die risikogedrag van sportdeelnemers met nie-deelnemers vergelyk is, is gevind dat die swart sportdeelnemer die hoogste risikogedrag getoon het, gevolg deur die kleurling-, blanke en laastens die Indiër-sportdeelnemer.

Sigaretrook word as ’n primêre, voorkombare koronêre risikofaktor in die moderne samelewing beskou (McArdle *et al.*, 1994). Rook hou ook direk verband met longkanker, emfiseem, blaaskanker, laringiale kanker en verskeie gastroïntestinale siektes. Selfs passiewe rokers is blootgestel aan sekere gesondheidsrisiko’s wat met rook gepaard gaan (Hendrix & Taylor, 1987).

TABEL 2. **FREKWENSIEVERSPREIDING: DEELNAME AAN ROOK, ALKOHOL, DWELMS EN SEKSUELE PRAKTYK VOLGENS OUDERDOMME**

Gesondheidsrisikogedrag: Rook, alkohol en dwelms	**% 13 jaar**	**% 14 jaar**	**% 15 jaar**	**% 16 jaar**	**% 17 jaar**	**% 18 jaar**	**p**
Het al probeer rook	65.22	58.18	60.66	60.00	75.47	66.67	0.580
Rook meer as een sigaret per dag	13.04	20.37	28.81	36.92	39.29	40.48	0.436
Rook by skool	0	1.85	16.22	16.92	21.34	14.29	0.016*
Rook elke dag	0	7.41	8.33	18.46	23.21	19.05	0.351
Snuif gom	0	0	3.33	1.30	7.14	0	0.049
Het al alkohol geproe	52.17	65.45	80.33	78.13	91.07	92.86	0.005**
Vyf of meer drankies in kort tyd gedrink	8.70	9.09	16.39	23.44	41.07	35.71	0.001**
Dagga/Marijuana	4.35	3.64	11.67	14.06	30.36	28.57	0.007**
Dagga by skool	0	0	1.67	1.54	1.79	4.76	0.648
Gom	0	1.82	5.00	6.15	5.36	11.90	0.284
Heroïne/kokaïne	0	0	0	0	1.79	0	0.593
Steroïdes	3.64	3.33	1.54	0	0	7.14	0.424
Dwelms aangebied by skool	0	10.91	6.67	13.85	10.00	14.29	0.309
Het al seksuele omgang gehad	0	10.91	20.00	21.14	40.48	50.00	0.001**
Met meer as een persoon seksuele omgang gehad	0	10.91	18.03	20.00	29.09	43.90	0.001**
Kondoom gebruik	0	8.55	16.67	18.00	29.00	40.00	0.001**
Was al swanger	0	0	0	1.61	0	2.38	0.001**

* $p<0.05$ ** $p<0.01$

Soos blyk uit Tabel 2, is daar nie statisties betekenisvolle verskille tussen die rookgewoontes

van die adolessente van verskillende ouderdomme nie. Die groot persentasie adolessente wat aangedui het dat hulle al probeer rook het, dui daarop dat rook 'n gewilde risikogedragsaktiwiteit is waarmee adolessente eksperimenteer. By die gewoonterokers is daar 'n duidelik stygende lyn in rookgedrag vanaf 16 tot 18 jaar. Dit is ook opmerklik dat dit hierdie seniors is wat by die skool rook. By al die vrae oor die seksuele praktyk is daar 'n stygende deelname met ouderdom. Volgens die studie van Anteghini *et al.* (2001) is die risikogedrag wat geassosieer word met vroeë deelname aan seksuele aktiwiteite, dwelmgebruik, die dra van 'n wapen, partytjies en 'n geskiedenis van seksuele molestering.

Alkoholmisbruik word volgens Williams (1994) regoor die wêreld beskou as 'n dwelmprobleem wat sekere gesondheidsrisiko's inhou. Daar is, soos blyk uit Tabel 2, betekenisvolle verskille gevind by die alkoholgebruik en die gebruik van dagga/marijuana by

adolessente van verskillende ouderdomme. By die seksuele gedrag is daar ook betekenisvolle verskille gevind by adolessente van verskillende ouderdomme, met 'n groter frekwensie van deelname by die ouer adolessent.

In heelwat studies is kommer uitgespreek oor die jeugdige ouderdom waarop adolessente begin eksperimenteer met gesondheidsrisikogedrag (Du Randt *et al*., 1999, Greenberg *et al*., 1992, Warren *et al*., 1997). In die artikel van Greenberg *et al* (1992) is die mening uitgespreek dat daar 'n betekenisvolle verhoging in die seksuele aktiwiteite van jong adolessente in die VSA is, en dat daar 'n toename is in seksuele eksperimentering vanaf 10- tot 14-jarige ouderdom. Du Randt *et al.* (1999) en Warren *et al.* (1997) spreek kommer uit oor die verband tussen vroeë deelname aan een risikogedragskomponent wat lei tot latere deelname aan meer gesondheidsrisikogedragskomponente.

In een van die vrae van die YRBS wat in hierdie studie gebruik is, word daar gevra op watter ouderdom sekere risikogedrag die eerste keer geïnisieer is. Die respons hierop word in Tabel 3 voorgestel.

TABEL 3. **OUDERDOM VAN INISIËRING VAN RISIKOGEDRAG**

Risikogedrag: Rook, alkohol, seksuele aktiwiteit & marijuana-gebruik	**11-12 jaar**	**13-14 jaar**	**15-16 jaar**	**17+ jaar**
Hoe oud was jy toe jy die eerste volle sigaret gerook het?	12%	22%	26%	17%
Hoe oud was jy toe jy die eerste keer 'n volle drankie gedrink het?	19%	22%	26%	17%
Hoe oud was jy toe jy die eerste keer met dagga/marijuana geëksperimenteer het?	1%	4%	7%	5%
Hoe oud was jy toe jy die eerste keer seksuele omgang gehad het?	7%	5%	9%	4%

Uit Tabel 3 blyk dit duidelik dat adolessente reeds op 'n jeugdige ouderdom risikogedrag beproef. In 'n studie van Warren *et al.* (1997) wat in die VSA onderneem is, is die volgende gevind oor die ouderdom waarop risikogedrag geïnisieër is: alkohol gebruik: op nege jaar (10.6%), 11 jaar (18.2%), 13 jaar (32.7%), 15 jaar (62.8%) en 17 jaar (14.1%). Eerste hele sigaret gerook: nege jaar (4.8%), 11 jaar (11.15%), 13 jaar (23.8%), 15 jaar (43.1%), 17 jaar

(58.0%). Eerste keer seksueel aktief: 12 jaar (5.6%), 13 jaar (10.2%, 14 jaar (28.3%), 15 jaar (42.7%), 17 jaar (58.6%). Eerste keer marijuana gebruik: nege jaar (1.3%), 11 jaar (3%), 13 jaar (7.4%), 15 jaar (19.2%) en 17 jaar (34.3%). Dit blyk dus uit hierdie ondersoek dat kinders selfs jonger as 11 jaar begin deelneem aan risikogedrag. Uit die inligting in Tabel 3 sowel as uit die ondersoek van Warren *et al*. (1997) blyk dit dat hoewel deelname aan risikogedrag reeds vroeg geïnisieer word, daar 'n toename is in die risikogedrag tot 16 jaar, met 'n geringe afname na 17-jarige ouderdom.

Die meeste navorsers is oor die algemeen van mening dat volgehoue deelname aan fisieke aktiwiteit 'n verlagende effek op mortaliteit sal hê, as gevolg van die positiewe uitwerking

daarvan op verskeie fasette van algemene gesondheid (Blair *et al.*, 1995). Uit die resultate in Tabel 4 blyk dit dat daar wel adolessente uit die verskillende jaargroepe is wat fisiek onaktief is. Dit is ook duidelik dat fisieke onaktiwiteit reeds vanaf 14 jaar afneem. Die ure wat aan TV kyk bestee word is baie hoog, 'n kommerwekkende feit wat kan lei tot die vestiging van 'n sedentêre leefwyse.

TABEL 4. **FISIEKE ONAKTIWITEIT VOLGENS OUDERDOMME**

Risikogedrag: Fisieke onaktiwiteit	**% 13 jaar**	**% 14 jaar**	**% 15 jaar**	**% 16 jaar**	**% 17 jaar**	**% 18 jaar**	**p**
Neem nie deel aan hoë-intensiteit-oefening	12	28	31	34	33	29	0.907
Neem nie deel aan matige oefening	26	43	42	31	47	50	0.243
Neem nie deel aan kragoefeninge	11	39	35	40	33	45	0.258
Neem nie deel in 'n skoolsportspan	44	36	37	30	44	29	0.636
Kyk meer as drie uur per dag TV	91	93	82	80	89	88	0.207

* $p<0.05$ ** $p<0.01$

SAMEVATTING

Die risikogedragskomponente wat in hierdie studie ondersoek is, is intensionele beserings (dra van 'n wapen, geweld en selfmoord), rook, alkohol en dwelms, seksuele gedrag en fisieke onaktiwiteit. Die resultate van hierdie studie het getoon dat adolessente reeds vanaf 13-jarige ouderdom aan gesondheidsrisikogedrag deelneem. Volgens Du Randt (1999) lei die deelname aan een vorm van risikogedrag op 'n vroeë leeftyd tot deelname na besliste eksperimentering van ander risikogedrag. In hierdie studie was die grootste tendense by die ouer adolessent gevind. Die grootste frekwensie deelname aan die verskillende vorme van risikogedrag is by die 16-17-jarige adolessent gevind. Statisties betekenisvolle verskille is gevind by geweld (onveligheid by die skool), alkoholgebruik, gebruik van dagga/marijuana en seksuele gedrag.

Uit die onderhawige studie het dit ook na vore gekom dat sommige adolessente alreeds op 'n vroeër ouderdom as 13 jaar, dus terwyl hulle nog in die laerskool is, met

gesondheidsrisikogedrag eksperimenteer. Dit noodsaak dus ook dat daar ondersoek ingestel word na die risikogedrag van laerskoolkinders (11-12 jaar) en dat die jeug op skoolvlak en op informele vlak in die gemeenskap gewaarsku word teen die gevare van vroeë deelname aan riskikogedrag wat skadelik is vir die gesondheid.

Dit mag wees dat insidensie van onwenslike risikogedrag wat in hierdie studie gerapporteer is, laer is as wat werklik die geval is, veral in die geval van die blankes en die Indiërs. In hierdie twee kulture word die risikogedrag wat in hierdie studie aangeraak is (behalwe fisieke onaktiwiteit), as totaal onwenslik bestempel. Die reaksie van hierdie twee groepe op

byvoorbeeld die vrae oor seksuele aktiwiteit was dieselfde; hulle het gegiggel, selfbewus rondgekyk, en die seuns het opmerkings gemaak. Daar word aanbeveel dat indien die studie herhaal word, die leerlinge in kleiner groepies (nie meer as 10 nie) verdeel word ten einde meer beheer te kan uitoefen.

SUMMARY

Health risk behaviour of adolescents of various ages

The health risk behavioural factors that were investigated in this study are intentional injuries (carrying of a weapon, violence and suicide), smoking, alcohol and drugs, sexual behaviour and physical inactivity. The results of the study showed that adolescents take part in health risk behaviour from as early as 13 years of age. According to Du Randt (1999) the participation in one form of risk behaviour at an early age definitely leads to experimentation in other risk behaviour later in life. The greater frequency of participation in the various forms of risk behaviour has been found in 16-17 year old adolescents. Statistically meaningful differences were found in violence (insecurity at school), alcohol use, use of dagga/marijuana and sexual behaviour.

It has become apparent from the present study that some adolescents as early as 13 years of age, while they were in primary school, had already experimented with risk behaviour. It is therefore essential that the risk behaviour of primary school children (11-12 years) be investigated and that the youth at school level and on an informal level in the community be warned of the dangers of early participation in risk behaviour that can be detrimental to their health.

It may be that the incidents of risk behaviour reported by the pupils in this study is in fact under reported, especially in the cases of the white and Indian population. In these two cultures the risk behaviour that is dealt with in this study (except inactivity) is deemed undesirable. The reaction of these two groups on for example the questions of sexual activity was the same; they giggled, looked around self consciously, and the boys made comments. It is recommended that if a similar study is undertaken, the pupils be divided into smaller groups (not more than 10) to obtain more control over them.

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OVERWEIGHT AND OBESITY AND MOTOR PROFICIENCY OF 3- AND 4-YEAR OLD CHILDREN

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ABSTRACT

Childhood obesity has increased over the last two decades, with increasing concern regarding health and other developmental risks. The aim of this study was to examine the prevalence of overweight and obesity and the differences in gross motor skills between overweight and obese 3- and 4-year old children and their non-obese counterparts in Potchefstroom. Three fundamental motor tasks were qualitatively (the quality of the execution of the skill) and quantitatively (the measurable score given to the performance of the skill, e.g. distance in mm) assessed in 19 overweight and obese participants and 111 non-obese participants in age-matched groups. The prevalence of obesity (15.83%) found in this sample, corresponds with worldwide and national trends in this age group, but is higher than the prevalence found in South Africa. Differences of statistical significance were established with t-tests as well as non-parametric analysis. The results showed no statistical differences in the 3-year old group, while statistical differences were found in favour of the non-obese participants in the 4-year old group with regard to quantitative scores for balancing on one leg and the quantitative and qualitative scores of catching, suggesting that overweight and obese children perform poor in comparison with non-obese children in tasks that require good balancing ability and good perceptual and spatial abilities. The results suggest that the influence of overweight and obesity on gross motor skill development is not significant at 3 years of age, but increases in such measurements that it can impede development at 4 years of age.

Key words: Obesity; Motor competency; Gross motor skills; Pre-school children.

INTRODUCTION

Childhood obesity has received a lot of attention in the literature in recent years (Goran *et al*., 1999; Owens *et al*., 1999; Van Mill *et al.*, 1999; Writer, 2000) due to the increase of obesity and overweight among children over the last two decades and due to the health risks involved (Van Mill *et al*., 1999; Dietz, 2000).

The prevalence of obesity has increased among American children over the last twenty years (Cheung, 1995) and an increase has also been reported among English and Scottish children aged 4 to 11 years (Chinn & Rona, 1994). Relatively little research has been done on the

prevalence of childhood overweight and obesity among very young age groups in South Africa (Richardson, 1978; Monyeki *et al.*, 1999; National Food Consumption Survey, 2000). Richardson (1978) found a prevalence of overweight and obesity of 12-18% among white children, and 13-18% among black children aged 1-6 years, in his study on growth patterns in South Africa. In their study on the prevalence of obesity among pre-school black children in

Ellisras, a rural area in South Africa, Monyeki *et al*. (1999) found that boys of the ages 3-4 years showed the highest prevalence of obesity (15%). According to the National Food Consumption Survey of 1999 (National Food Consumption Survey, 2000), the average prevalence of overweight in South African children aged 1-9 years is currently 7.6%. However, the figure is much higher for children living in urban areas (12.5%), including 4-6 year old children (12%) (National Food Consumption Survey, 2000). The latter percentages are consistent with the prevalence of overweight among children in the United States of 11% to 24% (Flegal, 1999; Strand & Roesler, 1999; Ganley & Sherman, 2000) and in Canada (between 7 and 43%) (Marshall & Bouffard, 1997). Hernandez *et al*. (1998) found a prevalence of 32% in pre-schoolchildren, and these obese children showed significantly higher levels of blood pressure than their non-obese counterparts.

Other studies have also showed cardiovascular risk factors in obese children as young as three years (Freedman *et al*., 1999; Williams *et al*., 1998). Cardiovascular risk factors and other health risks associated with obesity in children including hypertension, diabetes, posture-related disorders and respiratory diseases, are emphasised in several studies (Raudsepp & Pääsuke, 1995; Auxter *et al*., 1997; Marshall & Bouffard, 1997; Neumark-Sztainer, 1999; Ganley & Sherman, 2000). However, relatively little research has been done on a different kind of health risk, possibly influencing the child's overall development and well being, associated with obesity, namely insufficient fundamental gross motor development of the pre-schoolchild.

The period of 2 to 7 years of age is considered to be the critical years of a child's motor development, as, through play and physical activities, the fundamental gross motor skills develop during this period (Gabbard, 1998; Gallahue & Ozmun, 1998). However, as obese children, especially girls, tend to avoid physical activity (Hoare & Larkin, 1991), this could lead to insufficient development of gross motor skills (Marshall & Bouffard, 1994; Auxter *et al*., 1997). Obesity, social seclusion and the resulting poor gross motor skills could again influence total well-being as the child's self-confidence and self-esteem, thus emotional development is affected (Fox, 1992; Marshall & Bouffard, 1994).

Slaughter *et al*. (1980) found moderate correlations in body fat and horizontal jump, vertical jump and the 50m-dash in a study involving 7-12 year old children, whereas Raudsepp and Jürimäe (1996) reported a relationship between the percentage body fat, and standing long jump and shuttle run in a study involving 10-11 year old children. Hensley and Whitfield (1982) found inverted relationships between body fatness and performance in the standing long jump, vertical jump and 400m run in preadolescent children. In two studies involving 6 year and 9-year old boys and girls, Marshall and Bouffard (1994; 1997) found significant relationships between obesity and gross motor competency. Compared to the non-obese groups, the obese groups in this study showed significantly lower scores in the locomotor subscale of the Test of Gross Motor Development, consisting of tests for running, galloping, hopping, leaping, horizontal jumping, skipping and sliding. No significant difference was found in the Object Control Skills subscale, consisting of tests for two-hand striking, stationary bouncing, catching, kicking and overhand throwing.

No research could be found on the relationship between overweight and/or obesity and gross motor skills in 3- or 4-year old children. The question arising is whether the prevalence of obesity is similar to what was found in the National Food Consumption Survey (2000) and in

other countries and whether a relationship between overweight and obesity, and gross motor competency exists among children as young as 3 and 4 years of age, as no evidence exists of such a relationship in this age group in South Africa. The purpose of this study is therefore to investigate the prevalence of and possible relationship between overweight and obesity, and movement competency in a group of 3- and 4-year old children in Potchefstroom, a city in South Africa.

METHODS

Subjects

The sample consisted of a total of 120 white subjects, of the ages of 3 (n=54; 26 males, 28 females) and 4 (n=66; 32 males, 34 females) years respectively. Age was determined according to each subject's last birthday. All subjects lived in Potchefstroom, came from a middle class background and had been enrolled in the movement development programme (MDP) presented by movement developmentalists of the Potchefstroom University for Christian Higher Education (PU for CHE). This programme is being presented on the premises of 10 pre-primary schools in Potchefstroom, as well as at the movement development centre at the university. Nineteen (19) obese and overweight (O) subjects were identified from this group of 120 subjects. To classify a subject in the overweight or obese group, percentage body fat, BMI and the Marshall Visual Rating Scale (MVRS) of Marshall *et al.* (1990) were used.

Research design

A one-time cross-sectional design was used as research method in the study. All the subjects were enrolled in the MDP for their first time, and all were evaluated before the implementation of the programme. All parents were briefed on the procedures before the evaluation started, after which informed consent was obtained from them for each subject. The evaluations were conducted on the premises of the schools and in the movement development centre at the university. Body composition measurements were done first, followed by the assessment of specific fundamental gross motor skills. The execution of these motor skills were videotaped and scored afterwards by the researcher.

Body composition assessment

Skinfolds (triceps and subscapular) and body height and mass were measured according to the procedures outlined by Lohman (1992). Each skinfold was measured twice, and the average of the two measures taken. The sum of the two skinfold-scores was then used to determine the percentage body fat of each subject using the tables of Lohman (1992). The body mass index (BMI) of each subject was determined according to the formula of *BMI=body mass in kg/(body height in M)*^{2}. As no national growth charts are available for the South African population, the growth charts of the Centres for Disease Control and Prevention (National Centre for Health Statistics, 2000) which are recommended for international use by the World Health Organization (Must *et al*., 1991) were used to classify a subject's BMI. To further confirm the diagnoses of obesity or overweight, each subject was visually evaluated using the Marshall Visual Rating Scale, MVRS (Marshall *et al.*, 1990). According to this simple rating

test, "1" implies *slim* (thin, anorexic-like), "2" implies *ideal* (optimal weight to height), "3" *overweight* (plump but not indicative to a health risk), and "4" *obese* (grossly overweight, at

perceived health risk). To classify a subject in the overweight or obese group, a percentage body fat of 20% (males) and 25% (females) or higher and 25% (males) and 30% (females) or higher respectively (Lohman, 1992), a corresponding BMI on the 85th percentile or higher and the 95th percentile respectively, according to the growth charts of the Centres for Disease Control and Prevention (National Centre for Health Statistics, 2000) and a 3 or 4-rating on the Marshall Visual Rating Scale (Marshall *et al*., 1990) were used.

Assessment of fundamental gross motor skills

Hopping, one leg balance and catching were selected as the three gross motor skills to be tested, as these skills are used extensively in established, validated and reliability-proven motor test batteries for children of these age groups (Bruininks, 1978; Folio & Fewell, 1983; Ulrich, 1985; Frankenburg, 1990; Henderson & Sugden, 1992) and because they represent the three categories of movement, namely basic locomotion (hopping), static balance (one leg balance), and manipulation (catching) (Gallahue & Ozmun, 1998). These three gross motor skills were qualitatively (the quality of the execution of the skill) and quantitatively (the measurable score given to a skill, e.g. time in seconds) evaluated.

To obtain a qualitative score, the developmental characteristics of the performed skill were analysed and compared to the developmental stage criteria of the expanded version of the Fundamental Movement Pattern Assessment Instrument (FMPAI) (Gallahue, 1996) for fundamental motor skills in children of the ages 2-7 years. This system is based on the research of McClenaghan (1976), De Oreo (1980), Halverson and Williams (1985), and Cratty (1986) on the developmental sequences of fundamental movement skills in children. According to Gallahue (1996), the FMPAI has proven to be highly reliable among trained observers and content validity has been established for the fundamental movements. According to the criteria of this system (Gallahue, 1996), the performed skill can qualitatively be classified into one of the three stages of fundamental motor development, namely the initial stage, the elementary stage, and the mature stage. A score of (*1*) was awarded if the skill was classified as being in the initial stage of development, (*2*) if it was in the elementary stage, and (*3*) if it was classified as being in the mature stage. If the performed skill showed characteristics of both the initial and the elementary stages, a score of (*1.5*) was awarded, signifying the transitional stage between the initial and the elementary stage. The same applied to the transitional stage between the elementary and the mature stage, which was awarded a (*2.5*). The skills were quantitatively evaluated following the following procedures:

Hopping (Ulrich, 1985; Frankenburg, 1990): The test entailed two trials of hopping forward on one leg as many times as possible, up to a maximum of 12 hops. The higher score was taken. Hopping was tested on both legs.

One leg balance (Bruininks, 1978; Gustafson-Munro, 1985; Frankenburg, 1990; Henderson & Sugden, 1992): The test entailed two trials of balancing on one foot, with the arms hanging at the sides, for as long as possible up to a maximum of 12 seconds. The subject was instructed to stand with the free leg bent backwards at the knee so that the foot was positioned behind the standing leg. The bent leg had to be kept off the floor and away from the supporting leg. Swaying was allowed, and the arms were allowed to move from the sides. Balancing was tested on both legs.

Catching (Bruininks, 1978; Folio & Fewell, 1983; Ulrich, 1985; Henderson & Sugden, 1992): The test measured the ability to catch an aerial, underhand thrown 20cm ball with two hands. The thrower was positioned two meters from the subject. The score was the number of successful catches out of four throws.

Every test was conducted by the researcher, and every child was videotaped individually, from the side, by a trained assistant. The researcher then scored each subject's performance after analysing the video recording.

Statistical analysis

All calculations of means (*M*), standard deviations (*SD*), t-values, degrees of freedom (df) and p-values were done using the Statistica for Windows (6.0) computer programme (Statsoft, 1995). Due to the differences in group sizes between the O-groups and NO-groups in each age category, an additional non-parametric test (Mann-Whitney-U test) was administered to confirm the results of the independent t-tests.

RESULTS

Prevalence of overweight and obesity

TABLE 1. **MEAN AGE AND BODY COMPOSITION VALUES FOR OVERWEIGHT OF OBESE (O) (n=19) AND NON-OBESE (NO) (n=101) CHILDREN**

Age & Body composition measurement	3-year olds		4-year olds	
	Obese (O) (n=9)	Non-obese (NO) (n=45)	Obes (O) (n=10)	Non-obese (NO) (n=56)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Age (year.month)	3.05 (0.03)	3.06 (0.03)	4.04 (0.03)	4.05 (0.03)
Triceps (mm)	16.10 (3.46)	9.65 (2.54)	16.35 (1.11)	9.55 (2.53)
Subscapular (mm)	15.23 (8.65)	6.87 (2.11)	16.75 (8.15)	7.24 (2.56)
% Body fat	29.65 (10.02)	15.99 (2.94)	24.75 (4.25)	15.63 (4.96)
Body height (m)	0.99 (0.40)	0.98 (0.49)	1.09 (0.57)	1.05 (0.59)
Body mass (kg)	18.56 (2.07)	15.32 (1.91)	22.60 (4.88)	18.11 (1.90)
BMI	18.95 (1.97)	15.98 (1.33)	18.85 (2.45)	16.30 (1.22)
MVRS	3.69 (0.57)	1.20 (0.12)	3.54 (0.50)	1.23 (0.37)

SD: standard deviation

BMI: body mass index

MVRS: Marshall Visual Rating Scale score.

Nineteen overweight and obese subjects were identified, representing 15.83% of the total

group. From this group of 19, 11 subjects (9.17%) were overweight and eight (6.67%) obese. Furthermore, nine overweight and obese subjects were identified in the 3-year old group representing 16.67% (9.25% overweight and 7.42% obese) of the 3-year olds, while 10 subjects were identified as overweight and obese in the 4-year old group, representing 15.15% (9.09% overweight and 6.06% obese) of the 4-year olds. The average body composition values of the O groups and the NO groups are presented in Table 1. The results of Table 3 show that differences of statistical significance were established for body mass, percentage body fat and BMI in both groups.

Gross motor tests

TABLE 2. **MEAN VALUES OF THE GROSS MOTOR TESTS FOR OBESE AND OVERWEIGHT (O) AND NON-OBESE (NO) CHILDREN**

	3-year olds		4-year olds	
	Obese (O) (n=9)	Non-obese (NO) (n=45)	Obes (O) (n=10)	Non-obese (NO) (n=56)
Gross motor tests	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Hopping L quantitative	2.22 (1.68)	2.70 (1.76)	4.60 (2.80)	6.20 (2.81)
Hopping L qualitative	1.11 (0.33)	1.24 (0.43)	1.50 (0.53)	1.77 (0.50)
Hopping R quantitative	2.38 (1.38)	3.02 (2.10)	4.50 (3.34)	6.22 (3.01)
Hopping R qualitative	1.13 (0.35)	1.34 (0.48)	1.50 (0.53)	1.80 (0.43)
Balance L quantitative (sec)	3.22 (1.86)	3.23 (2.12)	4.00 (1.41)	6.25 (2.65)
Balance L qualitative (sec)	1.44 (0.53)	1.53 (0.50)	1.60 (0.52)	1.98 (0.53)
Balance R quantitative (sec)	3.00 (2.00)	3.18 (2.19)	4.11 (1.62)	6.09 (2.66)
Balance R qualitative (sec)	1.38 (0.52)	1.47 (0.55)	1.78 (0.44)	2.09 (0.55)
Catching quantitative	3.44 (1.13)	3.72 (0.81)	3.30 (1.25)	3.90 (0.37)
Catching qualitative	1.33 (0.50)	1.67 (0.52)	1.60 (0.52)	2.04 (0.38)

1: initial phase
1.5: transitional phase between initial and elementary phase
2: elementary phase
2.5: transitional phase between elementary and mature phase
3: mature phase

The values in Table 2 indicate that differences favouring the NO-group were found in all the quantitative and qualitative evaluations of all three components in both the age groups. However, no significant differences were found between the O- and NO-groups for the 3-year olds with regard to any of the gross motor tests. In the case of the 4-year olds, significance ($p \leq 0.05$) differences were established for balancing on the left and the right leg (quantitative)

and catching (quantitative and qualitative). As a significant difference in scores for hopping on the right leg (qualitative) and balancing on the left leg (qualitative) was established when applying the t-test, but not when applying the Mann-Whitney-U test (Table 3), these differences were not considered to be of statistical significance.

TABLE 3. **SIGNIFICANCE OF DIFFERENCES BETWEEN O- AND NO-GROUPS FOR 3- AND 4-YEAR OLD CHILDREN (N=120)**

	3-year olds (n=54)				4-year olds (n=66)			
	t-Test			Mann-Whitney-U	t-Test			Mann-Whitney-U
Test item	**t-Value**	**df**	**p**	**p**	**t-Value**	**df**	**p**	**p**
Body mass	-4.60	53	0.00*	0.00*	-5.10	65	0.00*	0.00*
% Body fat	-7.96	53	0.00*	0.00*	-8.37	65	0.00*	0.00*
BMI	-5.63	53	0.00*	0.00*	-4.87	65	0.00*	0.00*
Hopping L quantitative	0.47	53	0.64	0.45	1.66	65	0.10	0.13
Hopping L qualitative	0.84	53	0.40	0.55	1.54	65	0.13	0.21
Hopping R quantitative	0.54	52	0.59	0.58	1.63	66	0.11	0.14
Hopping R qualitative	1.21	52	0.23	0.34	2.06	66	0.04*	0.13
One leg balance L quantitative	0.00	52	1.00	0.76	2.61	66	0.01*	0.01*
One leg balance L qualitative	0.48	53	0.63	0.68	2.11	65	0.04*	0.10
One leg balance R quantitative	0.21	53	0.83	0.85	2.16	65	0.03*	0.04*
One leg balance R qualitative	0.44	52	0.66	0.73	0.16	66	0.11	0.20
Catching quantitative	0.87	53	0.39	0.65	2.98	66	0.00*	0.02*
Catching qualitative	1.81	53	0.08	0.13	3.16	66	0.00*	0.05*

*= $p \leq 0.05$ BMI: Body Mass Index L: Left leg R: Right leg.

DISCUSSION

The prevalence of 11 overweight (9.17%) and eight obese (6.67%) children found in this study, totalling 15.83% of the total group, is higher than the reported prevalence of overweight among pre-school urban children in South Africa, of 12% (National Food Consumption Survey, 2000). This percentage is also higher than or consistent with the estimated prevalence of obesity among pre-schoolchildren in the U.K. and Canada of 3% and 6% (Epstein &

Higgins, 1992) and overweight among American children of 11-24% (Flegal, 1999; Ganley & Sherman, 2000). The age period of around 5-6 years is considered to be one of the periods of growth during which the risk for obesity is markedly increased (Goran *et al*., 1999). The high percentage of overweight and obese subjects in the age group in this study seems to support the suggestion of Bar-Or *et al*. (1988) and Goran *et al*. (1999), that an even earlier age period might be a period of high risk for the development of overweight or obesity.

No differences of statistical significance were found in the 3-year old group, suggesting that overweight and obesity do not influence gross motor skills at this early age. However, although not significant, all the scores of the NO-group in the gross motor tests were higher than the same scores of the O-group, indicating a tendency toward better gross motor performance of the NO-group. Possibly, because this group of children are at an early stage of gross motor development and vary considerably in their rate of motor development at this early age (Frankenburg, 1990; Gallahue & Ozmun, 1998; Thomas, 1999), differences in motor development are not yet significant.

No significant differences were established for hopping in the 4-year old group. Possibly, as in the case of the 3-year olds, the skill of hopping is at a too early stage of development at 4 years of age to be significantly influenced by overweight and obesity, although a tendency toward better performances in the NO-group can be seen (Table 2), which would be statistically significant at $p \leq 0.2$ (Table 3). Furthermore, relatively large standard deviations in these tests for hopping (Table 2) could be an indication that the rate of motor development at this age is too varied to show significant differences.

The results found with regard to the gross motor tests of the 4-year old group contradict the findings of Hensley *et al.* (1982) and Raudsepp and Jürimäe (1996), that adiposity is related to motor items in which the body is projected or moved, but not to static items such as one leg balancing and catching. However, their studies were based on results obtained on older subjects. Regarding balancing on one leg, significant differences were found in the 4 year old group regarding the quantitative scores of these tests (Table 3). This skill is dependent on good static balancing ability. The point of gravity shifts and the base of support (the feet) becomes smaller when a person's body size increases (Haywood, 1993). This factor can have a negative influence on performance in balance skills (Auxter *et al*., 1997). Furthermore, poor balance skills can be detrimental to the development of all other gross motor skills, as balance and posture control are the basis for the development of all gross motor skills (Auxter *et al*., 1997; Gallahue & Ozmun, 1998). The negative influence of obesity on this skill seems evident from these findings.

The significant differences in the quantitative and qualitative scores for catching which were established in the 4 year old group, indicates that the O-children in this group might already be lagging behind their NO-counterparts in their development of age-appropriate perceptual and

spatial abilities necessary to catch both accurately and skilfully. Possibly, the 4 year old overweight and obese subjects in this study, by avoiding or not participating regularly in physical activities, have not acquired the age-appropriate stage of development in these skills for which sufficient movement experiences are needed.

CONCLUSION

To summarise, the results of this study show that there is a relatively high prevalence of

overweight and obesity in this selected group of 3- and 4-year old children in Potchefstroom. They also show a relationship between important gross motor skills and overweight and obesity at the age of 4 years, and, although not significant, similar tendencies at 3 years of age. These results seem to suggest that the influence of overweight and obesity on gross motor skill development which may not be significant at 3 years of age, increases in such a way in one year's time that it may lead to gross motor deficits at 4 years of age. As these results lead to the question whether overweight and obesity could increasingly impede gross motor skill development as a pre-schoolchild gets older, further research is suggested to investigate the influence of overweight and obesity on gross motor skill development at 5 and 6 years of age.

The results obtained with this study should be evaluated in the light of the following limitations, lessening the measure of generalisability. Firstly, a comparatively small, and a selected, group of subjects was used. Secondly, the classification of overweight and obese children in one category might have influenced the results. It is possible that clearer differences might be obtained between groups if the classification of obesity (excluding overweight) is applied, thus comparing an obese group to a non-obese group. This may also limit the possibility of classification errors, which can be a problem at this young age due to large variation in tempo of growth. Bearing these limitations in mind, but also the significant differences found in this study, it is suggested that future research should be conducted to further examine the problem, but that they should make use of larger, and if possible randomly selected populations, and compare only obese groups with non-obese groups.

Overweight and obesity have many causes, among them caloric imbalance from eating incorrectly in relation to energy expended in the form of activity, dysfunction of the endocrine glands and emotional disturbance (Auxter *et al*., 1997). People working with pre-schoolchildren can contribute to the control or even prevention of overweight and obesity by creating an environment in which the pre-schoolchild is encouraged to be physically active and in which the child can have successful movement experiences, thus enhancing the child's feeling of self-worth (Hoare & Larkin, 1991; Auxter *et al*., 1997; Hernandez, 1998). One way of creating such an environment, is to optimise the development of gross motor skills in this critical period via sufficient and frequent physical activities. Acquisition of fundamental motor skills is essential to develop a healthy lifestyle and to participate in health-enhancing activities in later life, thus preventing obesity. Giving children of these young ages the stimulation and opportunities to develop these skills in order to develop a good self-image and a love for physical activity, could have a long-lasting effect on health behaviour and prevent the vicious cycle of a sedentary lifestyle, growing overweight, obesity and the concurrent health risks.

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THE EXPERIENCE OF FEAR IN HIGH-RISK SPORT

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ABSTRACT

The purpose of this study was to investigate the experience of fear as described by athletes who participate in physically dangerous sports. A phenomenological research design was employed. The data were obtained from extensive interviews with twelve participants representing six countries: South Africa, Namibia, Zimbabwe, The Czech Republic, The United States and Canada. Participants were high level competitors in gymnastics, white-water kayaking, ski racing and rock

climbing. An additional quantitative measure, Zuckerman's Sensation Seeking Scale, was used to complement the interview findings. The results were presented in the delineation of 26 meaning cluster groups and seven themes. High-risk sport participants indicated frequent experiences with "peak" and "ultimate" athletic moments including physiological changes during all stages of participation. The athletes used a variety of mental strategies to cope with perceived danger that included an increase in focus on technical aspects, imagery and denial.

Key words: High-risk sport; Fear; High-level competitors; Phenomenology.

INTRODUCTION

The topic of fear in sports has been greatly ignored. Many researchers make reference to fear when discussing anxiety, but fail to make a clear distinction between the two terms. When Freud (1924) described a specific reaction, such as escape combined with a sense of terror in the presence of a specific object, he used the word *furcht* (fear). He believed anxiety was separate from fear and was created from the submergence of unconscious sexual desires. According to Freud, anxiety is an attempt to control instinctive energy by using personal defence mechanisms. Other authors have noted the importance of threatening stimuli in their definitions of fear versus anxiety (Cattell & Scheier, 1961; Izard, 1972; Lynch *et al*., 1973). Hackfort and Schwenkmezger (1989) describe individuals in situations of fear as having awareness of the threatening stimuli. Persons who are experiencing anxiety are unaware of the threatening stimuli. Epstein (1972) focuses on the ability to avoid conflict as a means of comparing anxiety to fear. In situations of fear, the perceived threat is known and can therefore cause a specific action. Anxiety alone cannot produce specific avoidance behaviours.

In the current study, the term fear refers specifically to the fear of physical injury. An extensive review of the literature produced only one article directly related to fear of physical

[1] This article if derived from the first author's doctoral dissertation submitted to Stellenbosch University.

injury in sport. Athletes confront dangerous circumstances on a regular basis. Some respond to these situations with calmness, certainty, and confidence. Others panic or lose focus causing a decline in performance or increased risk of injury. The purpose of this study was to gain insight and understanding on fear from the individual perspective of high-risk sport participants. A secondary objective was analysis of the personality dimension *sensation-seeking* (Zuckerman, 1979) as it relates to high-risk sport participation.

PURPOSE OF THE RESEARCH

The primary intention with this research was to understand the existential qualities of fear and to comprehend the meaning of the sport experience as it is perceived by participants in four high-risk sport codes namely, ski racing, rock-climbing, white-water kayaking and gymnastics. Thus, the overall question created was "what is the high-risk athlete's experience of *embracing fear*?"

METHOD

Participants

The participants were eight (n=8) male and four (n=4) female athletes in four different high-risk sports. The athletes participated in downhill ski racing, rock-climbing, white-water kayaking and gymnastics.

TABLE 1. **RESEARCH PARTICIPANTS**

Sport	Level	Sex	Age	Nationality
Ski racing	International	M	31	USA
	International	F	32	Canada
	National	M	27	USA
Rock-climbing	National	F	33	Namibia
	National	M	36	South Africa
	National	M	34	South Africa
Kayaking	World #1	F	42	Czech Rep.
	National	F	28	Zimbabwe
	World #1	M	42	USA
Gymnastics	Olympian	M	26	USA
	International	M	16	South Africa
	International	M	18	South Africa

The athletes were from six nations. Four of the participants were South African, four from the United States of America, one Namibian, one from Zimbabwe, one Canadian, and one from the Czech Republic. The athletes ranged in age from 16 to 42 with a mean age of 30.5 years. All participants had attained mastery of their sport and previously represented their countries at a national level. One participant was a national champion, one an Olympian, and two were world champions in their respective sports. The athletes had varying degrees of education and socio-economic histories. The participants were referred by friends, colleagues and sport contacts.

Research design

The qualitative method of phenomenology was implemented in the current study. In order to explicate the existential phenomenon of "fear", it was necessary to adopt a research method inclusive of the subjective reality of human experience. According to Farber (1966), phenomenology is a process-oriented discipline with its goal the uncovering of the essential features of consciousness as opposed to measuring factual content. The phenomenological researcher focuses on depicting the experience from the individual's perspective through an in-depth interview. The key components of phenomenological methodology as described by Giorgi (1970) include: (1) concern with the foundation aspects of the phenomenon; (2) concern with the qualitative dimension of human experience; (3) explication of the phenomenon within the context in which it appears; (4) concern with investigating intentional relations; (5) fidelity to the phenomenon as it is lived; and (6) presence of an involved scientist.

Procedures for acquisition of data

A participant release agreement between the researcher and the participant was signed prior to the interview. Eleven main aspects outlined by Kvale (1996) were used as a guide for an effective qualitative interview. The participants were provided with a list of the interview questions to facilitate the interview process. The participants were asked to select the desired location, time and setting for the interview. Each interview lasted 1-2 hours. The interview was conducted face-to-face and tape recorded for later transcription. An open-ended approach was used, allowing the participants to expound on ideas and add spontaneous and creative input.

Attention was given to the reliability and validity of the findings. The overall validity of findings was determined by the researcher's ability to remain neutral, honest and credible. A measure of confirmability was applied by means of a peer review to ensure internal validity. The review consisted of an analysis of the basic meaning unit clusters and subsequent agreement with the researcher in terms of the delineation of themes. The researcher and peer had an agreement rate of 80%. A follow-up interview supported internal consistency reliability. All participants were in agreement that the textural-structural synthesis matched their unique experience of "embracing fear".

A quantitative measure, Zuckerman's *Sensation Seeking Scale* (*SSS*) (Zuckerman *et al*., 1964), was applied with the intention to complement the core interview information. The questionnaire was distributed before the interview where adequate time was allowed to answer 40 multiple choice items. The SSS consists of five sub-themes: Thrill and Adventure Seeking Scale (TA); Experience Seeking Scale (ES); Disinhibition Scale (DS); Boredom Susceptibility Scale (BS); and General Scale (GS). The sub-scales TA and the GS are particularly relevant to the focus in this study.

Analysis of data

The major procedures applied included epoch, phenomenological reduction, eidetic variation, and synthesis. *Epoch* is a process of suspending past beliefs, or setting aside one's usual assumptions about life (Ihde, 1977). The challenge here is to view the phenomenon with an openness and freshness, allowing it to spontaneously reveal itself in an uncontaminated, pure form. According to Husserl (1964) *phenomenological reduction* consists of five distinct phases: bracketing, horizontalisation, delimiting, clustering of basic units, and formulating a fundamental-textural description (themes). The latter provides content used to determine the "essence" of the phenomenon. *Eidetic variation* is a process of observing the phenomenon from different perspectives and also incorporates recognising the salient qualities from the clusters of basic meaning units and creating core themes. The grouping of core themes from creative analysis of the basic meaning units is referred to as the fundamental-structural description. *Synthesis* involves combining the core textural and structural elements into one statement which is comprehensive and explicates the whole of the experience.

RESULTS

Twenty-six basic meaning units or clusters emerged using verbatim quotes extracted from the participant interviews. The meaning CLUSTERS are as follows:

1. Use of motivational self-talk in fearful situations
2. Sensation of flowing easily through athletic movements

3. Vivid recall of fearful experience
4. Focus on technical aspects of sport to compensate for fear
5. Sense of time is altered
6. Denial about intrinsic dangers of sport
7. Focus on relaxation to cope with fear
8. Absence of fear during peak performances
9. Heightened arousal precedes participation in high-risk sport
10. Absence of pain or discomfort during participation in high-risk sport
11. Sport participation brings great satisfaction to the athlete
12. Physiological changes occur during participation
13. Total absorption into activity
14. Alterations in visual perspective
15. Alterations in auditory perspective
16. A feeling of high or euphoria
17. Perceive sport participation as contributing to personal growth
18. Experience is different than participation in other sports
19. Concerned about others' perceptions of the sport
20. Recognition of subtle aspects as dangerous
21. Difficulty regaining confidence after highly fearful situation in sport
22. Experience had spiritual element
23. Deep connection and emergence with equipment or environment
24. The use of visualisation to cope with fear
25. Motivated by personal need for stimulation and change
26. Demonstrated creative capacity in life outside of sport

These twenty-six meaning cluster units were further delineated resulting in the emergence of seven major themes in this study. The following are the THEMES or core findings:

1. High-risk sport participants use a variety of mental strategies to cope with the intrinsic dangers of the sport.
2. Participants in high-risk sports report having "peak" experiences and "ultimate" athletic moments.
3. High-risk athletes have misconceptions and denial about the intrinsic danger of the activities.
4. Participants in high-risk sports undergo physiological changes before and during the activities.
5. The experience is satisfying and contributes to the overall personal growth of the participant.
6. High-risk athletes express the need for stimulation, change and creativity.
7. High-risk athletes view their sport as being unique and misunderstood by the general population.

Sensation Seeking Scale form V (SSS)

To complement the information collected from the core interviews, the participants were administered a quantitative instrument, the *Sensation Seeking Scale form V* (SSS). Sensation seeking is described as the willingness to take physical, social or psychological risks for the pure sake of experience (Zuckerman, 1979). The results obtained from the SSS supported the core interview findings. All of the participants scored above the mean on *Thrill and Adventure Seeking* (TA), demonstrating an overall willingness to take physical risks. Ski

racers had the highest overall sensation seeking scores as indicated by the *General Scale* (GS) and the highest TA scores. The climbers and kayakers in this sample were very similar on all the SSS sub-scales and had moderate overall sensation seeking tendencies and above average TA scores. Gymnasts had the lowest general SS scores in this sample. However, TA scores were still above the mean for gymnasts.

An interesting note on *sensation seeking* is that although all participants scored above the mean on TA, the overall measure for general SS tendencies was average. This indicates that although high-risk sport participants may be more willing to take physical risks, they are not necessarily more willing to take psychological or social risks.

DISCUSSION

Unique findings in the research

In the delineation of the second theme, subtle differences began to emerge between the current research and previous known studies on fear. Previous research has supported the notion that athletes experience "peak" moments in sport (Orlick, 1995). The occurrence of "peak" athletic moments among the participants in this study was high. All participants reported at least one "peak" moment in their athletic career with seven participants having multiple "peak" athletic moments. Two of the participants reported having these "peak" or "ultimate" moments on a regular basis. Alessi (1994) found that an important aspect of

"peak" experience in sport is the absence of fear or anxiety during the moment. Theme two of the current study supports this finding.

These results indicate a possible correlation between perceived "danger" and the occurrence of "peak" athletic moments. The current research found differences in the perspective of "fear" between high-risk athletes and athletes who participate in low or moderate-risk sports. High-risk athletes have a complicated perspective on "fear". Although this population engages in inherently dangerous activity, they also tend to express overt denial of the danger. Is this denial really a failure to recognise the risks involved? Perhaps it is a built-in coping mechanism allowing the continued engagement in dangerous activities. Future research could potentially reveal the validity of either hypothesis.

A second unique finding emerged in the delineation of theme six. Athletes involved in high-risk sport express the need for stimulation, change, and creativity. In a classroom study, Pufal-Struzik (1996) found that students who had higher sensation-seeking tendencies were more creative in problem-solving tasks. The current study found a potential correlation between sensation seeking and creativity in athletics. Eleven of the twelve participants in the current study expressed an in-depth investment and interest in creative activities beyond sport. The high-risk sport participants practised music, art, sculpture, poetry and other creative writing tendencies. One participant, a white water kayaker brought a personal portfolio of his artwork to the interview. These findings indicate a potential relationship between creativity and high-risk sport. Eysenck (1956) provides a framework for understanding this relationship. In his theory on extroversion, Eysenck (1956) proposed that extroverted individuals had decreased sensitivity in the brain and an increased tolerance for pain and external stimuli. Furthermore, extroverts compensate by expressing themselves through overt channels. Creative tendencies can be perceived as expression of oneself through overt means. Thus, the potential relationship between creativity and high-risk sport participation is further substantiated.

An additional finding in the current research emerged in the delineation of theme seven. High-risk athletes perceive their sport as being unique and misunderstood by the general population. It is apparent that the element of "fear" inherent in the activity separates high-risk athletes from other sport participants. Athletes in the current study expressed disappointment when asked about the perceived public perception of their respective sports. They described their disciplines as being continually labelled and negatively stereotyped. Generally, participants were concerned about the "narrow" public perception of high-risk sport. These feelings were incongruent with personal descriptions of their respective sports as dynamic, vivacious, diverse and exciting. Ten of the twelve participants reported feelings of disappointment, sadness, and frustration regarding the discrepancy between public and personal perception regarding high-risk sport.

IMPLICATIONS FOR FUTURE RESEARCH

The results of this study are a stepping-stone for numerous potential research topics. Among the most promising areas is further analysis between creativity and high-risk sport. Creativity proved to be a definitive characteristic of high-risk athletes as found in theme six. The creative choices of the athletes, however, were illustrated outside of the scope of sport. Future research could examine the direct relationship between creativity and sport. Another possibility is the examination of creative coaching techniques in coping with fear among athletes. What is the relationship between IQ, creativity and high-risk behaviour?

A second suggestion for future research could address the use of cognitive strategies in high-risk sports. A unique contribution in the current study was the use of specific cognitive strategies in fearful situations as delineated in theme one. This strategy involves converting one's focus from the danger of the moment to the technical aspect of converting a skill. For example, a rock climber will cognitively map or visualise a route while climbing, thus deflecting personal focus away from the inherent danger of falling. Downhill skiers and white water kayakers used similar cognitive mapping strategies. Future research could examine the relationship between cognitive strategies and coping with fear.

A third area for potential research concerns public perception of high-risk sport participation. The use of a traditional, quantitative method may be useful in this area. For example, a simple survey could compare opinions on high-risk sport between participants and non-participants.

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COMPETITIVENESS OF SOUTH AFRICA AS A TOURIST DESTINATION

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ABSTRACT

The aim of this paper was to determine which factors are important in order for South Africa to remain globally competitive. This is necessary as a result of more destinations globally offering tourism products, and because marketing, especially via the Internet, has opened up a new world for potential tourists. Coupled with this is the impact of globalisation on tourism. Despite the latter, South Africa has improved significantly since 1990 as one of the top tourist destinations in the world. To be able to achieve the aim of this paper, 150 international inbound tour operators were identified and a questionnaire was used to collate the required information. Sixty-four tour operators participated in this survey and the results showed that the assurance of safety was identified as the most important factor globally in order to be competitive. This research also identified South Africa's strengths and weaknesses as well as its competitive advantages. Safety was indicated as South Africa's greatest weakness from a tour operator's point of view. Marketing and dissemination of information regarding South Africa as a tourist destination also were not rated high in the survey. The paper concludes with the implications of the above findings for the tourism industry in South Africa, and by looking at what has to be done in order to remain competitive.

Key words: Competitiveness; Competitive advantage; South Africa; Tourism; Tourist destination.

INTRODUCTION

The world tourism industry is becoming increasingly sophisticated, and is changing rapidly, which results in new challenges, but also in uncertainty (Lickorish, 1991; Poon, 1993). Changing technology, more experienced consumers, global economic restructuring and environmental limits to growth are some of the challenges that countries and tourism managers face. This reality of change makes competitiveness a real concept, and winning no longer just means surviving, but leading. Competitive strategies are more important to ensure that industry players and tourism destinations stay ahead of the competition: "…for to lead is to win!" (Poon, 1993:3).

According to Porter (1990), competitiveness has various meanings for various entities, for example:

- To firms, competitiveness implies the ability to compete in world markets with a global strategy.
- To many members of the US Congress, competitiveness implies that the nation has a positive balance of trade.

- To some economists, competitiveness implies low cost of labour adjusted for exchange rates.

From a tourism perspective competitiveness implies the first meaning, namely the ability to compete in world markets with a global strategy. If one has to define it in layman's terms, competitiveness is about staying in the race (Du Plessis 2002). In order to achieve this in tourism, one has to keep track of changes in tourists' needs and the demands of globalisation in a sophisticated tourism industry (Lickorish, 1991; Poon, 1993; Ivancevich *et al.*, 1997; Ritchie & Crouch, 2000).

In the light of the situation in the tourism industry, competition among tourism destinations has become very intense, more destinations are competing on the experience level, and a significantly higher market transparency regarding prices and/or other comparable destinations attributes have increased the competition (Saayman, 2000).

PROBLEM STATEMENT

The fundamental product in tourism is the experience of the destination (Ritchie & Crouch, 2000). Competition, therefore, centres on the destination. Although competition occurs between airlines, tour operators, hotels and other tourism services, this inter-enterprise competition is ultimately dependent upon and derived from the choices tourists make between alternative destinations (Ritchie & Crouch, 2000).

The attractiveness of a travel destination reflects the feelings, beliefs, and opinions that an individual has about a destination's perceived ability to provide satisfaction in relation to special vacation needs. The "new" tourists are well read and know what they want, and where they wish to go (Saayman, 2001). The more an individual believes a tourism region will satisfy his needs, the more attractive that region will be and the more likely it is to be selected as a potential travel destination (Hu & Ritchie, 1993; Poon, 1993).

Based on World Tourism Organisation figures (WTO, 1998) over the ten-year period 1988-1997, global tourist receipts increased between 5.4 and 9.8% per annum. Growth rates, however, displayed a general decline in the last 3 years of the period as the industry matures. Similarly, the growth in arrivals declined from 8.0 to 3.7% per annum. Although the growth

in global tourism appears certain to continue at rates that are respectable for most industries, maturing growth rates have, and will, cause many destinations increasingly to covet the success of other destinations in securing a share of the market, which is expanding more slowly.

According to Du Plessis (2002), the tourist demand cycle shows that new and emerging destinations grow over time in their appeal to tourists. Initially, a new destination goes through an exploration phase, which attracts few tourists, and as the appeal for the destination grows, more tourists visit the destination. This creates a greater demand, and new developments soon follow.

Gaining a sustainable competitive advantage according to Athiyaman and Robertson (1995) requires the continual application of energy and resources to strategic planning and results from decisions and actions, which not only generate economic value, but are unique and hard

to imitate. These factors are normally defined as critical success factors and some authors also make reference to strengths and weaknesses in this regard.

For countries to be competitive, it is also important to identify their competitive advantage. South Africa is an emerging market in the tourism industry, but is already referred to as "a world in one country" (Satour, 1995) and is the top tourism destination in Africa. The country's improvement in its global position from 55th in 1990 to 25th in 2000 on the world's top tourism destinations (WTO, 2001) supports the potential of the country to be globally competitive. In the realisation of the challenge of being globally competitive, questions arise, such as: what are South Africa's strengths and weaknesses as a globally competitive tourist destination and what is the competitive advantage of South Africa as a global tourist destination?

In order to ensure sustainable tourism growth, which can include economic, social and ecological attractiveness of South Africa as a tourism destination, aspects of global competitiveness are of great concern. The challenge faced by managers and local tourism authorities increasingly call for an understanding of global competitiveness and the ability to be globally competitive. For world-wide tourism destinations, and therefore also South Africa, competitive advantages are no longer located in natural resources, but are increasingly man-made, driven by science, technology, information and innovation (Swart, 1997). Therefore, it is not the stock of South Africa's natural resources that will sustain the country's competitiveness in tourism, but how these resources are managed and to what extent they are complemented with man-made innovations and quality service (South Africa, 1996).

Based on the above, the aims of the paper are as follows:

- Firstly to determine the strength and weaknesses of South Africa as a tourist destination;
- Secondly, to identify South Africa's competitive advantage by identifying the five most important aspects (draw cards) that gives it a competitive advantage;
- Thirdly, to determine factors pertaining to global competitiveness.

RESEARCH METHOD

A two-pronged approach was followed, namely a literature study and a survey. The literature study was used in order to identify the factors pertaining to competitiveness.

The survey was conducted with 150 inbound international tour operators. These tour operators were randomly selected from the South African Tourism database of 218 tour operator companies attending Southern Africa's largest tourism exhibition held annually in Durban. This exhibition, which is known as INDABA, is held especially to exhibit Southern African products to international tour operators. Sixty-four questionnaires that were returned could be used for the research. The survey was conducted by means of a questionnaire that was faxed and/or e-mailed. The questionnaire focussed mainly on what international tour operators regarded as important to be competitive in a rapidly changing environment.

RESULTS

South Africa's strengths and weaknesses

The results are presented in three categories. Firstly, the respondents identified South Africa's strengths and weaknesses. Secondly, the five most important aspects of South Africa's tourism product, which give the country a competitive advantage, were identified, and thirdly factors that play a role in global competitiveness were rated. The aspects listed in Tables 1 and 2 were compiled from work done by the following researchers: Porter (1990), Butler (1991), Luk *et al.* (1993), Edgell and Smith (1994), McIntosh *et al*. (1995), Otto and Ritchie (1995), Butcher (1997), Stabler (1997), De Keyser and Vanhove (1998), Sirše (1998), Ritchie and Crous (2000), and Saayman (2000).

Table 1. **SOUTH AFRICA'S STRENGTHS AND WEAKNESSES**

Aspects	Strength %	Weakness %
1. Location; Long-haul destination	30.00	70.00
2. Dependencies on support services	50.00	50.00
3. Safety	11.48	88.52
4. Value for money	96.77	3.23
5. International marketing	38.60	61.40
6. Availability of information	58.06	41.94
7. Quality of service	62.90	37.10
8. Geographical features	100.00	
9. Marketing connections (networks)	58.18	41.82
10. Accessibility	66.00	33.93
11. Infra- and suprastructure	66.67	33.33
12. Historical & cultural resources	91.67	8.33
13. Climate	100.00	
14. Availability/quality of accommodation	88.71	11.29
15. Sports/recreational opportunities	85.96	14.04
16. Scenery	100.00	
17. Food	91.94	8.06
18. Entertainment	83.33	16.67
19. Uniqueness of local people's life	88.33	11.67
20. Historical attractions	87.93	12.07
21. Museums, cultural attractions	89.47	10.53
22. Ability to communicate	88.71	11.29
23. Festivals	54.17	45.83

24. Shopping	85.96	14.04
25. Attitude towards tourists	64.01	35.19
26. Public transportation	13.33	86.67
27. Foreign exchange	91.67	8.33
28. Friends and family	81.48	18.52
29. African branding	61.11	38.89

Respondents were requested to indicate which aspects were strengths or weaknesses. Table 1 therefore indicates the percentage of respondents who identified an aspect as a weakness or a strength. Table 1 shows that most of the aspects listed can be regarded as strengths. One hundred percent chose geographical features, climate, and scenery to be South Africa's most important strengths. Value for money (96.77%), historical and cultural resources (91.67%), food (91.94%) and foreign exchange (91.64%) were also identified by the respondents as strengths. The respondents identified safety (88.52%) as the biggest weakness followed by public transportation (86.67%). South Africa as a long haul destination (70%) is also regarded as a weakness, as well as international marketing (61.40%) of South Africa as a tourist destination. Marketing connections, which imply networking with various stakeholders, were rated separately and also did not score high as a strength (58.18%).

SOUTH AFRICA'S TOURISM PRODUCT

To the question what international tour operators regarded as the five most important aspects of South Africa's tourism product that give the country a competitive advantage as a global competitive destination, the following graphic representation of the results will suffice:

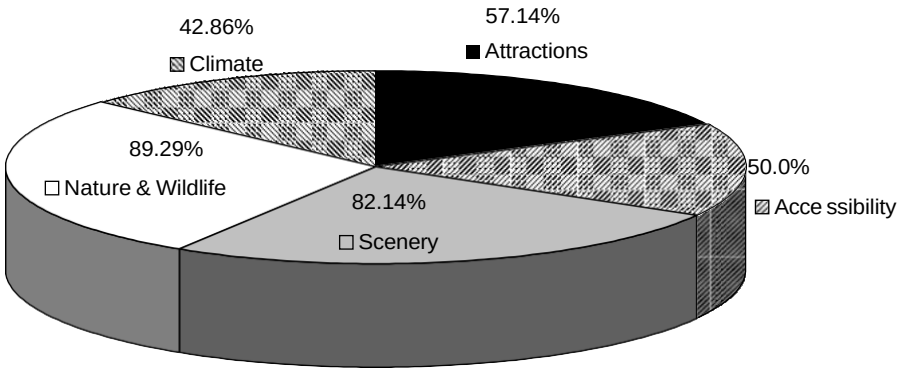

Figure 1. **MOST IMPORTANT ASPECTS OF SOUTH AFRICA'S TOURISM PRODUCT MAKING IT A GLOBALLY COMPETITIVE DESTINATION**

The aspects illustrated in Figure 1 as selected by 88.88% of the respondents prove that nature and wildlife (89.29%) is the most important, followed by scenery (82.14%) and variety of attractions (57.14%), which include places like Cape Town, the Kruger National Park and Robben Island. This was followed by accessibility (50%) in comparison with South Africa's competitors, and climate (42.86%). Compared to other African countries, South Africa is more accessible in terms of number of air carriers and number of flights available from across

the world. Coupled to this is the availability of international airports. From a tour operator's point of view, one can also say that these are the reasons tour operators use to package and sell South Africa as a tourist destination. This correlates well with other research on the reasons why tourists travel to South Africa (Satour, 2000).

FACTORS IN GLOBAL COMPETITIVENESS

Each respondent was also requested to rate the factors identified in the literature study that play a role in global competitiveness in determining the preferred choice between countries as a tourist destination. These factors are applicable to all destinations and not only to South Africa.

TABLE 2. **FACTORS IN GLOBAL COMPETITIVENESS**

Factors	% Response	Rating

1. Location; Long-haul destination	51.62	18
2. Dependencies on support services	66.13	14
3. Safety	96.78	1
4. Value for money	88.90	4
5. Marketing	80.00	6
6. Availability of information	91.94	3
7. Quality of service	95.17	2
8. Geographical features	75.86	7
9. Marketing connections (networks)	51.61	19
10. Accessibility	67.22	13
11. Infrastructure & tourism suprastructure	71.18	10
12. Historical & cultural resources	53.23	17
13. Climate	59.68	16
14. Availability/quality of accommodation	74.39	8
15. Sports/recreational opportunities	17.74	25
16. Scenery	87.10	5
17. Food	72.58	9
18. Entertainment	25.80	23
19. Uniqueness of local people's life	70.97	11
20. Historical attractions	61.29	15
21. Museums, cultural attractions	50.00	20
22. Ability to communicate	61.29	15
23. Festivals	16.13	26
24. Shopping	33.87	22
25. Attitude towards tourists	69.35	12
26. Public transportation	19.36	24
27. Foreign exchange	33.87	22
28. Friends and family	37.10	21
29. Other: Airline links		
30. Other: Easy acquisition of visas		

A five point Likert scale was used which rated items from no opinion (1) to very important (5). For the purpose of this article the highest two categories, namely important to very important on the Likert scale, were added together and prioritised. Table 2 indicates the generic factors in global competitiveness. Therefore these factors are not a reflection of South Africa specifically but include all tourist destinations. It is interesting to note that availability of information and marketing that go hand in hand received a high rating from respondents. These aspects are important because they influence decision-making as well as image and positioning (Botha, 1998).

Aspects that had a score of 80% and higher were safety, quality of service, value for money, availability of information, scenery and marketing. These factors are also listed in Table 3 and a comparison is made with regard to South Africa's strengths and weaknesses as identified in Table 1. The high number of attacks globally on tourists, for example in Egypt 1998, the Philippines and Pilgrim's Rest in South Africa (2002), and Bali (2002) to name but

a few, makes the finding that safety is an important consideration a very logical one. The September 11 attacks on the United States of America, although not aimed at tourists specifically, have also had serious implications for the tourism industry globally (Du Plessis, 2002).

TABLE 3. **FACTORS OF COMPETITIVENESS VERSUS SOUTH AFRICA'S STRENGTHS AND WEAKNESSES**

Factors	Competitiveness	Strengths	Weaknesses
Safety	96.78%	11.48%	88.52%
Quality of service	95.17%	62.90%	37.10%
Value for money	88.90%	96.77%	3.23%
Availability of information	91.94%	58.06%	41.94%
Scenery	87.10%	100.00%	-
Marketing	80.00%	38.60%	61.40%

The results in Table 3 show that in terms of the six most highly rated factors of competitiveness compared to South Africa's strengths, only two scored well, namely value for money and scenery. Quality of service and availability of information received a higher than average score as a strength, but not significantly so. Safety and marketing were rated as South Africa's biggest weaknesses. The former was identified previously (Table 2) as the most important factor in global competitiveness.

IMPLICATIONS AND CONCLUSIONS

The mere fact that South Africa has improved its position in a relatively short space of time to become one of the top destinations in the world is remarkable. However, the challenge is for it to remain competitive and to sustain its current growth rate. In order to do that, the results of this research clearly indicate which aspects need attention. Competing in the tourism industry globally has changed significantly over the past five years. More tourist destinations are entering the tourism arena globally, for example China, Russia and other former communist countries. These changes should be borne in mind by the South African tourism industry if it wishes to remain a global player.

The findings of this study has several implications, especially for the South African tourism industry, namely:

- Safety is an aspect that has to be addressed for it is seen as the single most important factor determining a tourist's choice of destination. Even though South Africa scored well in scenery, wildlife and nature as well as value for money, these aspects were regarded as less important than safety. Government at all levels has an important role to play in guaranteeing tourist safety, for example by the introduction of tourist policing in order to combat crime against tourists, as was done in Durban.

- International marketing and the dissemination of information pertaining to South Africa have to be one of the priorities in order to sustain a globally competitive position. It is

important to make sure that various markets understand what South Africa is all about as well as what it has to offer tourists. Marketing is important because through marketing a country can position itself, build a specific image and brand its products. Marketing can also help communicate certain messages, for example the addressing of safety issues. Marketing policies and strategies should therefore make provision for sustaining a competitive position.

- The most important aspects of South Africa's tourism product should be packaged and well promoted. These are great scenery, nature, climate and other attractions that are very accessible, especially in an African context.

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SENSATION SEEKING, GENDER AND SPORT PARTICIPATION AMONG SOUTH AFRICAN STUDENTS

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ABSTRACT

Amongst the personality dispositions, sensation seeking (SS) has special relevance in explaining and predicting types of risk-related behaviours, such as participation in sports containing high risk and even danger. The prevalence of risk-taking in the context of sport, and the impact of gender, was the objective of the present study. All subjects were administered the Sensation-Seeking Scales of Zuckerman Form II and

V (SSS-II & V). The results show that male sports participants are higher risk-takers than female participants, thus concurring with the general profile of male and female tendencies concerning sensation seeking behaviour. The resulting data are discussed and explained within the context of Zuckerman's sensation-seeking model.

Key words: Sensation seeking; Gender; Age; Culture; Sport.

INTRODUCTION

Optimal arousal as a behavioural phenomenon was observed by Wundt (1893), suggesting a curvilinear relationship between affective reactions and intensities of stimulation. Nearly sixty years later, Leuba (1955) maintained that organisms *prefer* some intermediate range of stimulation experienced as optimal for that organism. Berlyne (1960: 194) stated that "for an individual organism at a particular time there will be an optimal influx of arousal potential, deviating in either an upward or downward direction from this optimum, and will be drive inducing". The preferred optimal level varies among individuals, ranging from high to relatively low. Those with the inclination for high arousal tend to prefer novelty, change, variation, excitement, uncertainty and even risk taking, contrary to those preferring relatively low or stable levels of optimal arousal.

Zuckerman (1979, 1994, 2000) extended the optimal arousal concept to include variations of sensation seeking behaviours which moved beyond the optimal level of arousal; including the seeking of varied, novel, complex and intense sensations and experiences (Zuckerman, 1994), together with the proneness to take physical, social, legal and financial risks for the sake of such experiences. Risk taking constitutes involvement in any kind of behaviour perceived as uncertain regarding the positive or negative outcomes for oneself or for others. Thus, individuals who have a strong need for varied, novel, and complex sensations and experiences are labeled as high sensation seekers. To conclude: people have a basic need for excitement, and one way or another, they will fulfil it (Zuckerman, 2000).

Humans are distinguished as low or high sensation seekers. Low sensation seekers tend to be over-aroused and tend to avoid excessive stimulation in order to attain a level optimal for effective functioning. High sensation seekers, however, are characteristically under-aroused and seek novel and varying stimulation to raise their arousal to a level optimal for their functioning (Schwartz *et al*., 1978). Apart from kinds of sensation seeking that are expressed through physical action (thrill and adventure), there are those expressed through the casting off of inhibitions in social settings (disinhibition), or through deviant lifestyles (experience-seeking), or through the pursuit of change for change's sake (boredom susceptibility) (Zuckerman, 2000).

High risk experiences, or living on the edge, are associated with marijuana smoking, alcohol abuse, drug use, risky sex, gambling, and sports-orientated experiences such as scuba diving, caving, rugby, hang-gliding, sky-surfing, free flying, aerial ballet, motor or bike racing, bungee-jumping, parachuting, white water rafting, kayaking, and others. Some of these behaviours manifest in tandem with each other, such as smoking, drinking, taking drugs and engaging in sexual activities. Both male and female students who use or experiment with one of them, also tend to do the others. Zuckerman (2000: 8) concluded "…that people have a basic need for excitement - and one way or another, they will fulfil it".

Since 1960, Zuckerman has designed six Sensation-Seeking Scales (SSS) of which Form II

(SSS-II) and Form V (SSS-V) were chosen in the present studies, assessing four inter-related dimensions of sensation seeking. These instruments each comprised the following four dimensions: *Thrill and Adventure-Seeking (TAS)* - the desire to engage in sports and activities involving danger or speed; *Experience-Seeking (ES)* - the desire for unusual sensations or experiences associated with a nonconformist life style; *Disinhibition (Dis)* - the desire for social and sexual experiences as expressed in social drinking, partying, and a variety of sexual partners; *Boredom Susceptibility (BS)* - measuring aversion to repetition, routine and dull people; and *The Total Score (TS)* - derived from the summation of the four subscale scores (Schroth & McCormack, 2000).

GENDER

Sensation seeking spans across gender, age and cultural differences. The general perception exists that males are higher risk- and sensation seekers than females. Research by Zuckerman *et al*. (1964), using the SSS-II, and by Farley and Cox (1971), revealed no differences regarding gender and sensation seeking. However, using the SSS-IV, Kurtz and Zuckerman (1978), found that black and white female students scored significantly lower on the TAS, Dis and BS subscales than males. Zuckerman *et al.* (1978) and Zuckerman (1979) utilizing the more refined SSS-V, found that men had higher scores on all four subscales, as well the TS, with the largest differences manifesting on the Dis subscale consisting of items assessing the need to surpass social constraints through social drinking, partying and preference for sexual variety. Schroth (1990) using the SSS-V, found that men had higher scores on the TAS, Dis and BS, as well as the TS, but no significant sex differences on the ES subscale were found.

Gundersheim (1987), in a study on university athletes and non-athletes, found that the largest differences between males and females existed on the Dis subscale, followed by the TS, BS, ES and TAS, ascribed to differences in role stereotypes. Hartman and Rawson (1992) studied

sensation seeking in male and female athletes and nonathletes, using the latest version of the SSS, namely Form VI and found that males scored significantly higher than females on all subscales: Experience-Thrill and Adventure-Seeking: E-TAS; Intensions-Thrill and Adventure-Seeking: I-TAS; Experience-Disinhibition: E-Dis; Intentions-Disinhibition: I-Dis; and the Total Score: TS, regardless of athletic participation. Young males in their adolescent and directly succeeding years were the greatest risk-takers, as reflected in their high rates of auto accidents, alcohol and drug use, sex and antisocial behaviours (Zuckerman, 2000). Regarding participation in sport, the question arises whether differences in sensation seeking also manifest between males and females?

GENDER AND CULTURE

Magaro *et al*. (1979) found that among Italian college students, males and females did not differ with respect to SSS-IV scores. The results also revealed that Italian female college students are higher sensation seekers than Japanese and Thai female college students, but were similar to American students. However, Italian male college students appeared to be less sensation seeking than their American counterparts, and similar to Thai and Japanese males. The failure to find gender differences in the sample of Italian college students, differs from other cross-cultural studies, which, according to Magaro *et al.* (1979) may be ascribed to the possibility that male and female college students were differentially affected by exposure to education and socio-economic factors.

Ball *et al*. (1984) collected Australian data from 335 females and 363 males, distributed over the age range 17-60 years. They found that males showed higher SSS-V scores than females, replicating Canadian, American and English data. TAS scores showed this difference most clearly. However, the Total Score (TS) displayed significant gender-by-age interaction, a result differing most markedly from previously published findings, with females in the 30-39 age group recording higher scores than the males in the same age group. These results strongly support the wisdom of control for age in research on sensation seeking and gender differences (Ball *et al*., 1984). Similarly, Zuckerman *et al*. (1978) were cautious about generalizing the cross-national and cross-gender correspondence in SSS dimensions to other cultures, particularly where translated scales are required.

Ridgeway and Russell (1980) report results from Canadian subjects where females scored lower on the TS, Dis, BS and the TAS. Arnett and Ballejensen (1993) found that among Danish adolescents, gender was significantly related to most types of risk behaviour, with males more likely than females to take risks, an indication of gender differences in sensation seeking. The above ascribe gender differences to patterns of socialization factors within a specific culture, especially restrictions within the socialization environment. Less restrictive or broad socialization environments, however, facilitate the emergence of sensation seeking types of behaviours.

Torki (1993) provided evidence of cultural differences in sensation seeking. The SSS-VI (Arabic version) was administered to 254 male and female undergraduates from Kuwait University. Male students had significantly higher scores on the Experience-Thrill and Adventure-Seeking (E-TAS), Experience-Disinhibition (E-Dis) and Intention-Disinhibition (I-Dis) subscales. Torki (1993) concluded that these results were largely congruent with

findings in various other cultures, except for a similar study (also using SSS-VI) administered to US students, undertaken by Zuckerman (1984). On all four subscales and the Total Score, the American subjects had higher scores for males and females, than the Kuwait students. These findings were expected, because socialization of males and females in the Western culture differs significantly from that in the Arabic culture. Many of the SSS-VI items are more suitable to the Western culture, especially Dis subscale items, such as being in the company of people who are very casual about sex; who sometimes switch partners; having sex in public, where others were doing the same thing; and going to a large rock concert. The differences between American and Kuwait students could be interpreted as evidence for cultural differences in sensation seeking (Torki, 1993). Similarly, results obtained from other cultures, may not be congruent to sensation seeking patterns in South Africa.

The general pattern emerging from studies in different cultures during the sixties and early seventies, is that males are higher sensation seekers than females (Waters & Pincus, 1976; Zuckerman, 1971, 1972). This tendency was found among Thai subjects (Berkowitz, 1967), Spaniards (Perez & Torrubia, 1985), English from Britain (Furnham, 1984; Zuckerman *et al*., 1978), Americans (Zuckerman, 1978), and Japanese (Ohkubo, 1972). The subscales on which differences occur, however, reveal cultural differences, mostly ascribed to differences in value systems and practices of socialization. More research in the field of cross-cultural comparisons is needed.

The purpose of the present study is to extend the cross-cultural research on gender and sensation seeking to selected South African populations.

METHOD

Two independent studies were conducted.

First study

Subjects **-** The first study was undertaken during Spring 2000 involving 289 randomly selected dormitory students from Potchefstroom University for Christian Higher Education: 149 (52%) males and 140 (48%) females, and consisting of 92% Afrikaans and 8% English-speaking students, a reflection of the composition of the University's total student population.

Assessment **-** The traditional Sensation-Seeking Scale Form II (Zuckerman *et al*., 1964) was used. Senior and pre-trained students personally delivered and collected the questionnaires.

Procedures **-** All subjects were met individually and briefed about the nature and purpose of the study, and confidentiality and anonymity were assured. The questionnaire with an envelope was left with each subject and collected later the same evening. Each subject completed the requested demographic data (gender, home language, age) and the Afrikaans or English version of the SSS-II.

Second study

Subjects **-** The second study was conducted during Autumn 2001 and comprised four convenient samples: 85 full-time recreation students; 25 rugby players from the University's first and second teams; 16 rugby players representing the Western Transvaal provincial region; 51 scuba divers and 36 parachutists, thus a total of 213 of which 143 (67%) were males and 70 (33%) females; 76% were Afrikaans and 24% English-speaking, their ages ranging from 18 to 35 years.

Assessment **-** Zuckerman's Sensation-Seeking Scale, Form V (SSS-V), developed by Zuckerman *et al.* (1978), was used in the present study. Form V was constructed using factor analysis and consisted of four different subscales (TAS, ES, Dis, BS) of ten items each, totaling 40 items (TS).

Procedures **-** Subjects were met in groups and in a neutral atmosphere to assure objective and valid assessments (Schroth, 1990). All subjects were briefed about the nature and purpose of the study; confidentiality and anonymity were assured. The researchers were present to answer questions or solve problems that may arise. Each subject completed the requested demographic data (gender, home language, age) and the English version of the SSS-V. The scuba divers, however received their questionnaires by mail, accompanied by a letter in which the purpose of the study was stated, and their co-operation requested. A total of 136 questionnaires were mailed, with a final response of 51 (38%). The specific purpose of the scale was not explained to the subjects beforehand to avoid possible bias. Subjects were told that they were participating in a study on individual differences and personality. After completion, they were informed about the real nature of the study.

RESULTS

First study*: SSS-II*

In the first analysis it was determined whether an interactive relationship exists between low and high sensation seekers and gender. The combined mean score was used as the cutting point for dividing low from high sensation seekers. The 2 x 2 ANOVA revealed a significant interaction, $F(1.1)=25.33$, $p<0.005$ between sensation seeking and gender. The post-hoc t-test revealed that male students had significantly higher sensation seeking scores than females. Female students showed greater variance in their Total Scores (TS) than male students.

Second study: *SSS-V*

In this study, two gender comparisons were made: one between students (studying in recreation - N=85, plus male participants in the University's first and second rugby teams - N=25) and the other between predominantly adult participants in provincial rugby (N=16), scuba diving (N=51) and national parachuting (N=36), defined as the Student Group and the Sports Participant Group.

Students

It was expected that male students would obtain higher sensation seeking scores on the Dis, BS, TAS subscales and the TS, and that female students would score higher on ES. The results (Table 2) generally support this expectation, but statistical significance ($p<0.05$) was only obtained regarding the Dis dimension. Female students had significantly higher scores on the ES dimension ($p<0.01$) than male students. Except for TAS, mean scores were generally low, thus reflecting a student population of relatively medium to low sensation seekers.

TABLE 1. **MEANS, STANDARD DEVIATIONS AND T-VALUES (FORM II) OF MALE AND FEMALE UNIVERSITY STUDENTS**

Gender	N	Mean	SD	t-value
Male	132	17.63	5.00	
Female	113	15.80	5.19	2.80**

** = $p<0.01$

TABLE 2. **MEANS, STANDARD DEVIATIONS AND T-VALUES (SSS-V) OF MALE AND FEMALE UNIVERSITY STUDENTS**

Dimensions of *SSS-V*	Males (n=63)		Females (n=47)		t-Value
	M	SD	M	SD	
Dis	3.71	2.25	2.85	1.87	2.20*
BS	3.43	1.37	3.38	1.85	0.14
TAS	7.25	1.58	6.94	2.00	0.90
ES	3.25	1.61	4.09	1.65	2.64**

Total (N=110)	17.65	4.19	17.26	4.74	0.46

* = p<0.05
** = p<0.01

Sports participants

Participants in rugby, scuba diving and parachuting are generally regarded as relatively high sensation seekers, as reflected by the results in Table 3. However, it was expected that even within a population of high sensation seekers, males would have higher scores on Dis, BS, TAS and TS, with females scoring higher on ES. Except for ES, males had higher scores on the other four subscales (Table 3). The general pattern, in which differences are manifested, is very similar to the student findings.

TABLE 3. **MEANS, STANDARD DEVIATIONS AND T-VALUES (SSS-V) OF MALE AND FEMALE RUGBY PLAYERS, SCUBA DIVERS AND PARACHUTE JUMPERS**

Dimensions of *SSS-V*	**Males (n=80)**		**Females (n=23)**		**t-Value**
	Mean	**SD**	**Mean**	**SD**	
Dis	4.70	2.93	3.65`	2.64	1.54
BS	4.00	1.75	3.65	1.50	0.87
TAS	8.21	1.69	7.48	2.19	1.71
ES	4.74	1.73	5.00	1.98	0.62
Total (N=103)	21.65	5.61	19.78	5.85	1.39

DISCUSSION AND CONCLUSION

There is no simple explanation for why males tend to have higher scores on the Sensation-Seeking Scales (SSS) than females. There are many explanations, like greater body size and strength, which give males an advantage over females in TAS activities after puberty; it is not surprising that males typically show a higher peak of TAS than females.

Disinhibition (Dis) is the subscale that shows the largest gender differences. Although these differences are probably influenced by social factors, such as role socialization and expectations, this particular difference could also represent the operation of biological factors. Females are higher on monoamine oxidase (MAO), but they also tend to be augmenters. Zuckerman *et al.* (1980: 208) investigated biological correlates of sensation seeking and asserted that "the hormonal differences between males and females are equivocal, since high male sensation seekers are higher on both androgens and estrogens". Zuckerman (1979) suggested that there could be a biological basis for differences in sensation seeking, while also stating that cultural, social and familial factors must also be considered.

Arnett (1994) considered sensation seeking as a predisposition, a potential, which may be

expressed in a variety of ways depending on other aspects of the individual's personality, especially depending on how the socialization environment guides, shapes, or suppresses that predisposition. Although sensation seeking is inherently related to physical and social risk-taking, Arnett (1994) argues that it is more generally a quality of seeking intensity (rather than complexity) and novelty in sensory experience, which may be expressed in multiple areas of a person's life. Such behaviours can be antisocial as well as socially acceptable, depending largely on the individual's social environment. Differences ascribed to gender groups across cultures, are seen as to reflect different kinds of socialization rather than to associate them with biological processes (Ball *et al*., 1984).

Arnett (1994: 294) found adolescent and adult males to be higher in sensation seeking than females, and comments: "It may be tempting to suggest a biological basis for this difference ...

from infancy onward biological differences between males and females are inextricable form socialization". One area for future research of sensation seeking is the examination of the ways in which males and females may have their sensation seeking tendencies socialized into different avenues, resulting in the expression of sensation seeking in gender-related types of behaviour.

Items comprising the TAS subscale, may favour perceived and/or real participation in activities such as sky-diving, mountain climbing, scuba diving, water skiing, surfboard riding, diving off the high-board, fast skiing, and (plane) flying. Apart from their psychological culturally based appeal, participation and risk experiences also have a strong physical competence base relying on physical strength, agility, power, speed, endurance and the real or perceived competence to handle physical risk and danger. In general, males are biologically better equipped to handle these types of biologically anchored risks, and therefore also their willingness to participate in such activities. The sport world shows clearly that males are superior as far as speed, strength, power and the withstanding of physical injuries are concerned. Thus having an impact on risk perceptions of both males and females, as assessed by the various Sensation-Seeking Scales, especially those activities included in the TAS subscale. If high-risk target activities of a physical nature are selected, containing the same risk potential irrespective of gender differences, then the chasm of sensation seeking between males and females may not be as wide as presently revealed by the various sensation seeking measuring instruments.

Another area of concern is that many individuals participate in multiple high-risk sensation seeking activities. Although the present study did not examine this aspect of participation preferences, future research should attempt to investigate the impact of multi-sport involvement as it relates to various predictors. In addition, it should be noted that a number of high-risk activities vary in their degree or intensity of inherent risk. For example, playing rugby can be considered less dangerous than participation in scuba diving, depending on the experiences and competencies of those being assessed.

Gender may not be the best way to approach the underlying question of participation in high-risk activities. Perhaps a better method would be to examine the individual's level of masculinity or femininity. Rather than just being *male* and *female*, perhaps assessing the respondent's level of masculine traits and feminine traits would provide a different, and more informative perspective with regard to participation in high-risk activities. Research examining masculinity vs. femininity was stimulated by the development of the Bem Sex Role Inventory (Bem, 1974). This particular scale measures the degree to which an individual

exhibits feminine, masculine, or neutral personality characteristics. Based on their responses to these items, a classification of masculine, feminine, androgynous, or undifferentiated is assigned. By examining gender in this manner, perhaps a clearer understanding could be gained of the aforementioned relationship.

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THE EFFECT OF URBANISATION ON THE RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND OBESITY IN 10-15 YEAR OLD MALES IN THE NORTH-WEST PROVINCE OF SOUTH AFRICA: THUSA BANA STUDY

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ABSTRACT

The purpose of this study was firstly to investigate the relationship between physical activity and measures of obesity in 10–15 year old males in the North-West Province of South Africa. Secondly, the study aimed at determining the influence of age on the possible relationship between physical activity and obesity and thirdly, at determining the influence of urbanisation on the possible relationship between physical activity and obesity. A one-time cross sectional experimental design was used for this study. A total of 606, 10-15 year old males were recruited from 44 randomly selected schools in the North-West Province, which formed part of the THUSA BANA study during 2000 and 2001. Demographic data and physical activity participation were obtained through standardized questionnaires. Anthropometric measurements selected, were primarily those described in Norton and Olds (1996). Data analysis was performed using Statistica 2000 for Windows 1998. A one-way (ANOVA) and two-way analysis of variances together with Tukey post hoc HSD tests were used to indicate the differences between variables. The level of significance was set at $p<0.05$. Physical activity was not significantly associated with percentage body fat, body mass index or the sum of triceps and subscapular skinfolds in analysis of variances (ANOVA). Although there were no statistically significant differences between physical activity and the measures of obesity, the measures of obesity increased with a decrease in physical activity. In the application of the two-way analysis of variance, to determine the influence of age on the relationship between physical activity and obesity, some significant relationships were shown. The measures of obesity increased with an increase in age. There were also significant associations found in the application of the two-way analysis of variance, which determined the influence of urbanisation on the relationship between physical activity and obesity. The rural subjects had lower values of the indicators of obesity than the semi-urban and urban subjects, independent of their level of physical activity. This could indicate that socio-economic status and its influence on nutritional status,

play an important role in the prevalence of obesity.

Key words: Anthropometry; Age; Obesity; Physical activity; South Africa.

INTRODUCTION

Obesity can be defined as an over-accumulation of adipose tissue because of a positive energy balance (Queen & Lang, 1993; McArdle *et al*., 1994). The accumulation of body fat is an indication that more energy has been stored than has been used (Bray, 1990; Epstein *et al*., 1996).

There are currently a worldwide increase in the prevalence of obesity especially in children and adolescents (Pronk & Boucher, 1999; Trent & Ludwig, 1999). Recent studies revealed that about 25% of American children are obese (Bar-Or *et al.*, 1998; Pronk & Boucher, 1999; Trent & Ludwig, 1999). Possible causes for this increased prevalence of obesity in children and adolescents are modernisation, rapid urbanisation in developing countries and unsafe environments which all lead to a more inactive lifestyle (WHO, 1998; Leupker, 1999; Van Mil *et al*., 1999). The onset of obesity in childhood leads to an increased likelihood of obesity later in life. Between 70-90% of obese children and adolescents become obese adults (Lechky, 1994; Bar-Or *et al*., 1998; Trent & Ludwig, 1999). Obesity is a chronic disease and is associated with a number of obesity-related diseases like: Coronary artery diseases, cancer, type II diabetes and psychological problems (Harlan, 1993; Rocchini, 1993; Williams *et al*., 1993; Bar-Or *et al*., 1998; Must & Strauss, 1999).

Seen in the light of the above it is clear that the increased prevalence of obesity in children is a problem worldwide. It is clear that there is a need for proper intervention methods to prevent and treat obesity in children. Physical activity has been proven to be an effective method in the prevention and treatment of obesity (WHO, 1998; Rippe & Hess, 1998; Sothern *et al*., 1999). Physical activity helps to prevent and treat obesity non-pharmacologically, by increasing the amount of energy expended, and increasing the resting metabolic rate (Goran *et al*., 1999).

South Africa is currently experiencing rapid urbanisation, especially of Africans leaving underdeveloped rural areas to seek a better lifestyle in and around the cities. In 1993, 48% of the South African population was urbanized, compared to 53% in 1996 (Anon., 1998). Researchers suspect that childhood obesity is or may become a public health problem in South Africa because of the rapid urbanisation and westernisation (acculturation) processes taking place at the moment. Together with the increase in dietary intake that is associated with urbanisation (Popkin & Doak, 1998), there is also a decrease in participation in physical activity due to unsafe environments (Bar-Or *et al.*, 1998). Children is sitting in front of the television or computer and do not play outside anymore (Bar-Or *et al.*, 1998). We know far too little of the prevalence of obesity in this population to address it in responsible and appropriate intervention programmes, but early prevention in childhood will lessen the health and economic costs of this epidemic in adulthood (Underhay, 2000).

The purpose of this study is therefore to investigate the relationship between physical activity and obesity in 10-15 year old males in the North-West Province of South Africa. Secondly, the study aimed to determine the influence of age on the possible relationship between physical activity and obesity. Thirdly, the study aimed at determining the influence of urbanisation on the possible relationship between physical activity and obesity.

METHODS

Subjects

The subjects of this study consisted of 606 males between the age of 10 and 15 years. The subjects formed part of the THUSA BANA Study (THUSA: Transition and Health during Urbanisation in South Africa; BANA: Children) conducted during 2000 and 2001. The subjects were recruited from three different strata regarding urbanisation in the North-West Province of South-Africa. Schools were randomly selected from a list of all the schools in the province. Subjects between 10 and 15 years were also randomly selected from class lists. Informed consent was obtained from the subjects and their parents, and the study was approved by the Ethics Committee of the Potchefstroom University for CHE, South Africa. A cross-sectional experimental design was used for this study.

Anthropometry

Anthropometric measurements were done by qualified anthropometrists under guidance of a level III anthropometrist. The measurements were taken according to standard methods as described by Norton and Olds (1996). The relevant measures for this study were: body mass and stature; triceps and subscapular skinfolds; waist and gluteul girths. Stature (maximum stretch) was measured by means of a stadiometer to the nearest 0.1 cm and body mass was measured by means of an electronic scale (Precision Health scale) to the nearest 0.1 kg. Girths were measured with a flexible Lufkin steel tape to the nearest 0.1 cm and skinfolds were taken using a Harpenden skinfold caliper with a jaw pressure of 10 g/mm^2 and skinfolds were taken to the nearest 0.2 mm. In order to determine Body Mass Index, the following equation has been used:

$$\text{Body Mass Index (BMI)} = \frac{\text{Body mass (kg)}}{\text{Stature (m}^2\text{)}}$$

Percentage body fat was calculated according to the equation of Boileau (1985):

Males 6 - 11 years:

$$\%\ \text{Body fat} = (\text{sum of triceps \& subscapular skinfolds}) - 0.012\ (\text{sum of triceps and subscapular skinfolds})^2 - 3.4$$

Males 12 -14 years:

$$\%\ \text{Body fat} = (\text{sum of triceps \& subscapular skinfolds}) - 0.012\ (\text{sum of triceps and subscapular skinfolds})^2 - 4.4$$

Males 15 -18 years:

$$\%\ \text{Body fat} = (\text{sum of triceps \& subscapular skinfolds}) - 0.012\ (\text{sum of triceps and subscapular skinfolds})^2 - 5.4$$

Percentage body fat were divided into three groups according to the classification of obesity in children (Lohman, 1992).

Low body fat: <12%
Normal body fat: 12.1–24.9%
High body fat (overweight and obese): >25%

Demographic information

The questionnaires were designed or adapted for this study population and were validated with appropriate methods (Underhay, 2002). Questionnaires were issued during individual interviews and conducted by the researchers and specially trained African fieldworkers in the language of the subjects' choice.

The questionnaire on demographic information included questions on type of housing, access to electricity, water source, household income category and number and ages of people living in the house. Subjects were classified into three levels of urbanisation using criteria based mainly on where people lived and the quality of their housing.

Stratum I : Rural group
Subjects live on farms or in traditional tribal villages. Subjects mostly live in brick houses and mostly with piped water and electricity available.

Stratum II : Semi-urban / Informal housing
Subjects live in informal housing areas also known as 'squatter camps' found adjacent to all major towns and cities. Shared water supply and electricity are sometimes available. Most subjects living in these areas moved there recently (mostly from rural areas and farms) and therefore represent people in the most rapid phase of transition.

Stratum III : Urban group
Subjects live in established urban townships (previously known as black locations), towns and cities. Water supply and electricity are available and people mostly live in westernised circumstances.

Physical Activity Questionnaire

The "Previous day physical activity recall" (PDPAR) questionnaire developed by Trost *et al*. (1999) was used in this study. Information regarding physical activity of the previous day was retrieved by this questionnaire. Subjects had to recall the activities of every 30 minute period they participated in the previous day and complete the activity questionnaire accordingly. The type and intensity of the activity was recorded on the questionnaire.

The intensity of the activities was divided into three different categories namely, high, moderate and low. A MET-value was used to express the intensity of the activity as a metabolic value (Trost *et al.*, 1999). One MET is equal to the energy expenditure associated with rest – 1 kcal/kg/hour or 3.5ml O_2/kg/min. To help explain this classification to children, pictures of low (<3 METS), moderate (>3 METS) and high (>6 METS) were used. MET-values of a specific physical activity was directly taken from the compendium of physical activities and energy expense list of the PDPAR (Ainsworth *et al.*, 1993; Weston *et al.*, 1997). A relative energy expenditure value was used to estimate the total daily energy expenditure by using the energy expense during specific periods of time. The 30 minute periods with a MET-value of 3 METS or more, as well as the 30 minute periods with a METS value of 6 METS and above, were added together. The activity level of subjects were classified in the following way: highly active when one or more of the 30 minute periods were coded as 6 METS, moderately active if two or more activities had a METS value higher than three and low active if two or less activities had a METS value below 3 (Pate *et al.*, 1997). The PDPAR was tested and approved as being valid and reliable by Weston *et al.* (1997) and a number of researchers has used this questionnaire (Prista *et al*., 1997; Pate *et al*., 1997) with good results.

Statistical analysis

Statistical analysis was performed using Statistica 2000 (StatSoft., 1984-2000) for Windows 98. Descriptive statistics were calculated for the relevant variables. One-way analysis of variance (ANOVA) was computed to determine the relationship between physical activity and obesity. A two-way analysis of variance were computed to determine the relationship of physical activity and obesity respectively with urbanisation and age. For both the one-way and two-way analysis of variance the Tukey HSD post-hoc procedures for unknown number of subjects were applied.

RESULTS

Descriptive and comparative statistics for the 606, 10-15 year old males are provided in tables 1 and 2. The subjects were divided in five groups according to age. Statistics for the anthropometric variables are given in Table 1. Descriptive statistics regarding the physical activity and urbanisation status of the 10-15 year old males are given in Table 2.

TABLE 1. **DESCRIPTIVE STATISTICS OF ANTHROPOMETRIC VARIABLES IN 10–15 YEAR OLD MALES (N=606)**

Variable	Age	N	Mean	Min	Max	SD
Triceps Skinfold (mm)	10	87	9.98	4.4	35.0	5.74
	11	113	8.99	4.3	24.2	3.63
	12	135	10.48	4.1	31.8	5.68
	13	86	10.07	4.2	31.0	4.82
	14	82	9.64	4.4	60.0	7.03
	15	96	9.37	4.0	60.0	6.89
	Total group	605	9.79	4.0	60.0	5.67
Sub-scapular Skinfold (mm)	10	87	7.00	3.2	31.0	4.93
	11	113	6.42	3.4	26.1	2.94
	12	136	7.70	3.4	32.3	5.11
	13	86	7.80	3.4	24.8	4.02
	14	82	8.08	4.4	60.0	7.07
	15	96	8.91	3.4	60.0	7.42
	Total group	606	7.65	3.2	60.0	5.47
Sum of triceps and subscapular skinfolds	10	87	16.99	7.6	63.0	10.32
	11	113	15.42	7.7	49.7	6.21
	12	135	18.21	8.6	64.1	10.51
	13	86	17.87	8.8	47.4	8.39
	14	82	17.73	9.7	120.0	13.86
	15	96	18.28	8.1	120.0	13.97
	Total group	605	17.45	7.6	120.0	10.78

TABLE 1. **DESCRIPTIVE STATISTICS OF ANTHROPOMETRIC VARIABLES IN 10–15 YEAR OLD MALES (N=606)** ***(cont.)***

Variable	Age	N	Mean	Min	Max	SD

Percentage body fat (%)	10	87	14.81	6.2	34.5	6.34
	11	113	14.08	6.3	34.1	4.90
	12	135	14.90	6.3	33.5	6.98
	13	86	15.07	6.6	32.6	6.33
	14	82	14.23	6.6	45.0	5.92
	15	96	13.58	4.7	45.0	5.92
	Total group	604	14.47	4.7	45.0	6.15
Stature (cm)	10	87	135.05	117.8	167.0	7.50
	11	113	139.20	104.9	164.7	8.26
	12	136	143.99	117.3	166.6	8.05
	13	86	150.55	130.5	176.6	9.79
	14	82	156.60	115.6	180.5	10.86
	15	96	162.84	140.9	184.5	9.53
	Total group	606	147.37	104.9	184.5	13.04
Body mass (kg)	10	87	29.33	17.0	69.6	7.15
	11	113	31.17	23.0	58.0	6.19
	12	135	35.06	20.4	89.3	9.18
	13	86	39.11	23.7	73.6	9.33
	14	82	44.35	28.1	95.2	10.96
	15	96	49.34	28.2	100.5	11.53
	Total group	606	37.60	17.0	100.5	11.47
Body mass index (BMI)	10	87	15.94	12.25	31.86	2.75
	11	113	16.01	12.56	24.71	2.24
	12	136	16.72	12.78	32.17	3.04
	13	86	17.06	12.97	26.36	2.51
	14	82	17.98	14.13	33.65	3.47
	15	96	18.45	10.96	36.74	3.29
	Total group	606	16.98	10.96	36.74	3.05

In Table 1, the mean sum of triceps and subscapular skinfolds for the total group is 17.45±10.78, while the minimum is 7.6 mm and the maximum is 120 mm. The minimum value of 7.6 was measured at the 10-year old group, while the maximum of 120 mm was measured at the 14- and 15-year old groups.

Lohman (1992) reported that the sum of the triceps and subscapular skinfolds can be used with accuracy as a measure of percentage body fat using specific reference tables to derive percentage body fat from the sum of triceps and subscapular skinfolds (Lohman, 1992). The mean value of 17.45 is classified in the optimal percentage body fat category according to Lohman (1992). However, the maximum values of 120 mm, which were measured at the 14- and 15-year old groups are classified in the very high percentage body fat category (very obese category).

TABLE 2. **DESCRIPTIVE STATISTICS OF PHYSICAL ACTIVITY AND URBANISATION FOR 10–15 YEAR OLD MALES (N=604)**

Variable	**Age**	**Low active**	**Moderately active**	**Highly active**
	10 (n= 88)	39	27	22

Physical activity	11 (n=112)	48	47	17
	12 (n=137)	60	56	21
	13 (n= 86)	40	35	11
	14 (n= 83)	43	33	7
	15 (n= 96)	41	31	24
	Total group (N=604)	271 (45%)	229 (38%)	102 (17%)

Variable	**Age**	**Rural**	**Semi-urban**	**Urban**
Urbanisation	10 (n= 88)	37	11	40
	11 (n=114)	55	16	43
	12 (n=137)	51	32	53
	13 (n= 86)	36	15	35
	14 (n= 83)	18	10	55
	15 (n= 96)	22	20	54
	Total group (N=604)	219 (36%)	104 (18%)	280 (46%)

The mean percentage body fat for the total group is 14.47±6.15%, while the minimum is 4.7% and the maximum is 45.0%. The minimum percentage body fat of 4.7% was found at the 15-year old group and the maximum of 45% was found at the 14- and 15-year old groups. The mean percentage body fat of 14.47% is in the optimal range according to Lohman (1992). The maximum percentage body fat values of 45.0%, is very high and indicate that these individuals are very obese and at high risk for chronic diseases. According to the above classification of percentage body fat, the THUSA BANA male population had 40% (n=243) underweight subjects, 52% (n=315) normal weight subjects and 8% (n=46) obese subjects.

Body mass index (BMI) has a mean of 16.98±3.05 for the total group. The minimum BMI is 10.96 and the maximum is 36.74. Both the minimum and maximum BMI values were found in the 15-year old group. This finding is expected, because BMI increases with an increase in age (De Onis & Habicht, 1996; Luciano e*t al.*, 1997; Troiano & Flegal, 2000) and thus it was expected that the lowest value would be found in the 10-year old group. There are a number of reference data regarding BMI. Troiano and Flegal (2000) used National Health Examination Survey (NHES) II and III and National Health and Nutrition Examination Survey (NHANES) III as reference population. Mean BMI values for NHES II and III are between 17.1 and 22.3 and between 18.4 to 22.4 for NHANES III for 10–15 year old children. The mean BMI of 16.98 for the 10–15 year old males in the THUSA BANA study are thus a bit lower than that of the reference population used by Troiano and Flegal (2000).

For the purpose of this study the subjects were divided into three groups with regard to physical activity, namely: highly active, moderately active and low active (see physical activity questionnaire). As can be seen in Table 2, there were more low active subjects in each age group than there were moderate and high active subjects. Subjects were also divided into three groups regarding urbanisation, namely: rural, semi-urban and urban.

TABLE 3. **THE RELATIONSHIP BETWEEN OBESITY AND PHYSICAL**

ACTIVITY AMONG 10–15 YEAR OLD MALES: THUSA BANA STUDY (N=602)

	Physical activity									
	Low			Moderate			High			
Variable	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**F- value**
Body Mass Index (BMI)	274	17.23	3.32	227	16.68	2.74	101	16.80	2.92	F(2.559) = 1.59
Sum of triceps + subscapular skinfolds	274	17.92	11.33	227	16.66	10.16	101	17.97	10.71	F(2.559) = 0.98
Percentage (%) body fat	274	14.80	6.51	227	13.98	5.79	101	14.78	5.92	F(2.559) = 1.23

According to the one-way analysis of variances and the Tukey HSD post hoc test there were no significant differences between the three indicators of obesity (percentage body fat, sum of triceps and subscapular skinfolds and body mass index) and physical activity. According to the results in Table 3, there was no statistically significant relationship between any of the indicators of obesity and physical activity. The mean BMI and percentage body fat values of the low active group were higher than that of the moderately active as well as the highly active groups. Although there were no statistically significant differences present, there was a tendency of the indicators of obesity (percentage body fat, sum of triceps and subscapular skinfolds and body mass index) to increase with a decrease in physical activity. It is interesting however, that the moderately active group had the lowest values for all the indicators of obesity, and not the highly active group, as was expected.

Table 4 shows the results of the two-way analysis of variance which investigated the influence of age on the possible relationship between physical activity and the three indicators of obesity. The only statistically significant differences ($p<0.05$) between the different age groups occurred were detectedin the BMI, where the 10 year old, low active group (a) (see Table 4) significantly differed from the low active 14- (e) and 15-(f) year old low active groups. The low active 11-year old group (b) also differed significantly from the 14- (e) and 15-(f) year old low active groups. The low active 11-year group (b) also differed significantly from the moderately active 10- (g) and 11- (h) year old groups. The low active 15-year old group (f) also differed significantly from the moderately active 10- (g) and 11- (h) year old groups.

TABLE 4. **AGE AND THE RELATIONSHIP BETWEEN OBESITY AND PHYSICAL ACTIVITY AMONG 10–15 YEAR OLD MALES (N=602)**

		Age Group								
Variable	**Physical activity**	**10**			**11**			**12**		
		N	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**

Body Mass Index (BMI)	Low	43	e,f a)16.31	3.64	47	e,f b)16.10	2.16	60	c)16.87	3.59
	Moderate	27	e,f g)15.65	1.92	47	e,f h)16.09	2.18	55	i)16.60	2.59
	High	22	m)16.09	2.39	17	n)15.64	2.59	20	o)16.67	2.49
Sum of triceps + subscapular skinfolds	Low	43	a)18.19	13.46	47	b)15.25	5.47	60	c)18.50	10.20
	Moderate	27	g)15.13	5.33	47	h)15.40	5.74	55	i)17.79	10.86
	High	22	m)18.20	9.27	17	n)15.88	9.09	20	o)18.48	10.94
Percentage body fat	Low	43	a)15.06	7.19	47	b)13.98	4.49	60	c)15.29	7.37
	Moderate	27	g)13.95	4.65	47	h)14.16	4.97	55	i)14.43	6.63
	High	22	m)16.20	7.14	17	n)14.07	5.82	20	o)15.08	6.98
Variable	**Physical activity**	**N**	**13 Mean**	**SD**	**N**	**14 Mean**	**SD**	**N**	**15 Mean**	**SD**
Body Mass Index (BMI)	Low	40	d)16.99	2.42	43	a,b,g,h e)18.60	4.14	41	a,b,g,h f)18.83	2.45
	Moderate	35	j)16.99	2.35	32	k)17.49	2.52	31	l)18.16	2.52
	High	11	p)17.52	3.41	7	q)16.44	1.84	24	r)18.19	3.52
Sum of triceps + subscapular skinfolds	Low	40	d)18.40	9.32	43	e)19.38	18.2	41	f)17.84	7.35
	Moderate	35	j)17.03	7.57	32	k)16.27	2.21	31	l)17.84	6.59
	High	11	p)18.59	7.75	7	g)14.24	6.59	24	r)19.60	15.0
Percentage body fat	Low	40	d)15.37	7.14	43	e)14.79	6.69	41	f)14.22	5.76
	Moderate	35	j)14.47	5.64	32	k)13.88	5.33	31	l)12.51	5.33
	High	11	p)15.89	5.58	7	g)12.33	2.24	24	r)13.85	4.65

N = number of subjects SD = Standard deviation
Significant difference ($p<0.05$) between groups is indicated by a, b,c, d, e, f, g, h and i above the group mean.

There were no statistically significant differences between the sum of the triceps and subscapular skinfolds and the different age and activity groups (see Table 4). It is interesting to note that the highly active 11-, 12-, 13-, and 15-year old groups had, unexpected, higher sum of skinfolds values than the low and moderately active groups. There was, however an increase in the sum of triceps and subscapular skinfolds with an increase in age, independent of activity level.

According to Table 4 there were also no significant differences between percentage body fat of the different age and activity groups. It is interesting that the moderately active groups had lower percentage body fat values than the low active and high active groups, irrespective of age.

Another interesting phenomenon was that the 10- and 13-year old high active groups had the highest percentage body fat values. Therefore, age had no influence on the non-significant relation between physical activity and the indicators of obesity in this study. However, there was tendency that body mass index increased with an increase in age, whereas percentage body fat and the sum of the triceps and subscapular skinfolds increased with an increase in age from 10–13 years and thereafter decreased. There also was a decrease in skinfold thickness with an increase in age, which could possibly be attributed to physiological changes in boys, due to puberty.

TABLE 5. **THE INFLUENCE OF URBANISATION ON THE RELATIONSHIP BETWEEN OBESITY AND PHYSICAL ACTIVITY AMONG 10–15 YEAR OLD MALES: THUSA BANA STUDY (N=601)**

		Urbanisation								
		Rural			Semi-urban			Urban		
Variable	**Physical activity**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**
Body Mass Index (BMI)	Low	113	a)16.69[g]	3.07	46	b)16.53	2.01	115	c)18.05[a]	3.79
	Moderate	86	d)16.65	2.48	38	e)16.68	2.56	103	f)16.93	3.01
	High	17	g)16.25	2.87	21	h)16.65	3.63	62	i)17.06	2.69
Sum of triceps + subscapular skinfolds	Low	113	a)17.39	10.29	46	b)15.94	7.97	115	c)19.22	13.22
	Moderate	86	d)15.51	6.41	38	e)16.26	7.52	103	f)17.76	13.10
	High	17	g)15.09	7.05	21	h)20.15	16.53	62	i)18.13	8.97
Percentage body fat	Low	113	a)14.51	6.56	46	b)13.36	5.23	115	c)15.67	6.84
	Moderate	86	d)13.49	5.40	38	e)13.84	5.53	103	f)14.45	6.19
	High	17	g)12.96	5.19	21	h)14.90	5.70	62	i)15.29	6.17

N = number of subjects SD = Standard deviation

The results of the two-way analysis of variance which investigated the influence of urbanisation on the possible relationship between physical activity and the indicators of obesity are shown in Table 5 and Figures 1, 2 and 3. The only significant difference ($p<0.05$) between the different groups of urbanisation occurred at BMI, where the low active rural group (a) differed significantly from the low active urban group (g). The high active group had lower values of BMI and in some cases of sum of the skinfolds and percentage body fat, than the moderately active and low active groups, independent of their urbanisation group.

Urbanisation had no statistically significant influence on the non-significant relation between physical activity and the indicators of obesity (BMI, sum of triceps and subscapular skinfolds and percentage body fat). There was however a tendency that, the urban groups had higher values for the indicators of obesity than the urban and rural groups, independent of activity level, but there was no significant differences.

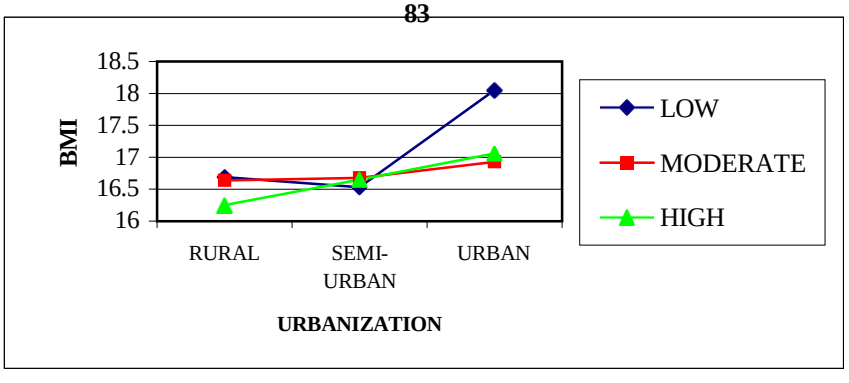

FIGURE 1. **THE INFLUENCE OF URBANISATION ON THE RELATIONSHIP BETWEEN BMI AND PHYSICAL ACTIVITY AMONG 10–15 YEAR OLD MALES: THUSA BANA STUDY**

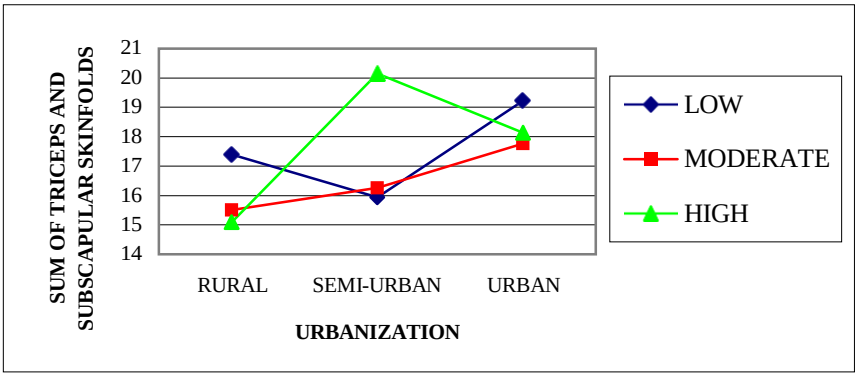

FIGURE 2. **THE INFLUENCE OF URBANISATION ON THE RELATIONSHIP BETWEEN THE SUM OF TRICEPS AND SUBSCAPULAR SKINFOLDS AND PHYSICAL ACTIVITY AMONG 10–15 YEAR OLD MALES: THUSA BANA STUDY**

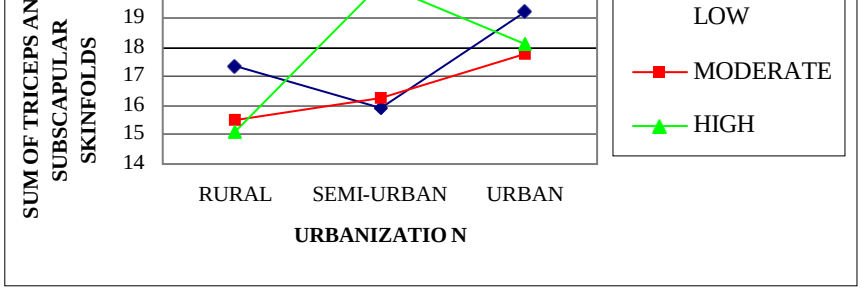

FIGURE 3. **THE INFLUENCE OF URBANISATION ON THE RELATIONSHIP BETWEEN PERCENTAGE BODY FAT AND PHYSICAL ACTIVITY**

DISCUSSION

According to Sothern *et al*. (1999) physical activity is an effective method in the prevention and treatment of obesity. According to this study it appears that there is only a decrease in the indicators of obesity (body mass index, percentage body fat and triceps and subscapular skinfolds) with an increase in physical activity from low active to moderately active. This relationship however, is not statistically significant. This results are contradictory with already existing research. Kemper *et al*. (1999) found that percentage body fat decreased with an increase in physical activity and visa versa.

According to this study, age has no statistically significant influence on the relationship between physical activity and the indicators of obesity. There was a tendency for body mass index to increase with an increase in age from 10 to 15 years. This could be because of growth and the accompanied increase in muscle mass in relation to body stature during this phase of adolescence. Guillaume (1999) and Troiano and Flegal (2000) which used the NHES II, NHES III and NHANES III as reference data also reported an increase in body mass index with an increase in age. This however was not the case with percentage body fat and the sum of the triceps and subscapular skinfolds, which increased with an increase in age, until 13 years and thereafter showed a decrease in values with an increase age until 15 years. These results are opposing to results by Lohman (1992) who found a direct increase in sum of triceps and subscapular skinfolds with an increase in age in adolescent boys in developed countries.

Figures 1, 2 and 3 show the influence of urbanisation on the relationship between physical activity and the sum of triceps and subscapular skinfolds, body mass index and percentage body fat as indicators of obesity. No statistical significant difference could be found between the variables, but there was a tendency for higher body mass index, sum of the triceps and subscapular skinfolds and percentage body fat values in the urban group than in the semi-urban and rural groups. The rural group had the most low active subjects, while the urban group had the most high active subjects, which is unlike expected. This could possibly be explained by the

fact that no organized physical activity exist in the rural communities. Although this children live in rural areas, they don't have to walk as far to school and to fetch water as in the past. Urban children however are exposed to organized sport activities and thus have a higher physical activity level. Another interesting phenomenon is that only at the rural group, the relationship between physical activity and the indices of obesity was like expected (a decrease in measures of obesity with and increase in physical activity). This could indicate that other factors than physical activity, like diet play an important role in the development of obesity in semi-urban and urban children.

Possible reasons for the lower values in the three indicators of obesity, in the rural and semi-urban groups could be that low socio-economic status which is associated with the rural and semi-urban subjects in this study could have an influence on the nutritional status of the subjects. The urbanisation of traditional rural people have generally been associated with a nutritional

transition characterized by increased intakes of energy, fat and processed foods, resulting in enhanced rates of obesity (Vorster *et al.*, 2000). The differences between the rural, semi-urban and urban THUSA BANA subjects could therefore possibly be attributed to the effect of urbanisation has on the changing of diet towards a more western diet. Most of the urban subjects has spent most of their lives in urban areas and followed a typical western lifestyle. Other factors, such as diet, probably played a more important role than physical activity in the development of overweight.

CONCLUSION

Based on the results of this study, it is concluded that there are no significant relationship between physical activity and the indicators of obesity in 10–15 year old males. There were also no significant differences as far as the influence of age and urbanisation on the relationship between physical activity and the indicators of obesity is concerned.

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A COMPUTERISED PROGRAMME FOR MONITORING ATHLETES' EMOTIONAL STRESS AND PAIN PERCEPTION

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ABSTRACT

Until the 1990s, rehabilitation interventions primarily addressed the physiological dimensions of sports injury. Although some athletes adapt psychologically to injury quite effectively, there appear to be many individuals who experience negative emotional responses after sustaining a sport-related injury. In the past, physiotherapy management focused on helping rehabilitating athletes' return to their prior level of functioning by treating their overt physical problems. Recently,

however, the sports medicine community has come to realise the integral role that psychosocial factors play in injury occurrence and the recovery processes. Because of their close involvement with injured athletes during rehabilitation, physiotherapists might be best suited to provide some form of psychological assistance to rehabilitating athletes. The objective of this study was to provide physiotherapists with a practical psychological instrument for the treatment of injured athletes. A computer programme to assist physiotherapists in identifying, referring or treating athletes who experience negative emotional responses was developed and evaluated.

Key words: Psychological assistance; Injured athletes; Rehabilitation; Physiotherapists; Treatment.

OVERVIEW OF CURRENT RESEARCH

Injury is, without a doubt, one of the most significant obstacles to successful sports performance (Heil, 1993). No athlete, regardless of experience and ability, is immune to injury and most physically active individuals find it difficult to avoid injury (Durso-Cupal, 1998). Sports injury is a serious and expensive health problem that has not abated, in spite of improvements in equipment and physical conditioning techniques (Bergandi, 1985). The elite athlete invests a great deal of time and energy to attain optimal performance in sport, hence any significant injury is likely to be perceived as a traumatic life event with physical and psychological ramifications. For some athletes a promising career may even be prematurely terminated because of serious injury (Quinn & Fallon, 1999). The ability to resist injury and to rehabilitate well when injury does occur is fundamental to longevity in sport and to the full realisation of sports potential.

Athletes react differently to injury, both physically and psychologically. Some seem to recover from injury quite easily, while others may experience negative emotions such as

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frustration, depression, anger, irritability and tension after sustaining a sports-related injury (Pearson & Jones, 1992). These responses can also be affected by the severity of the injury, with those athletes suffering from more serious injuries displaying significantly greater levels of frustration, depression and anger than athletes with less severe injuries (Smith *et al.*, 1990b). The emotional responses experienced by injured athletes can also impact on the rehabilitation process itself. According to Smith *et al.* (1990a) and Fisher (1990), athletes who experience negative emotional responses to injury, often suffer prolonged or problematic rehabilitation.

Until the 1990s, rehabilitation interventions primarily addressed the physiological dimensions of sports injury with the exclusion of the psychological dimensions (Petitpas & Danish, 1995). Injuries were mostly viewed from a structural, anatomical, or physical environmental point of view with little regard for affective, perceptual/cognitive and personological factors (Pargman, 1993). Interventions that facilitate injury prevention or coping with the threat to self-concept, beliefs, commitments and values were omitted in treatment (Danish, 1986; Steadman, 1993).

Scrutiny of the sports psychology literature reveals that much of the early research in the domain of injury rehabilitation, focused on the prediction and prevention of sports injury.

Considerably less attention was given to rehabilitative considerations. Andersen and Williams (1988) were of the first researchers to address this issue. They developed a multi-component theoretical model of stress and injury. This model proposes that athletes with a history of many stressors, personality characteristics that exacerbate the stress response and few coping resources will, when placed in a stressful situation, be more likely to appraise the situation as stressful and will exhibit greater psychological activation and attentional disruptions. The severity of the resulting stress response is instrumental in determining the risk of injury. The model also proposes certain interventions for reducing the risk of injury (Williams & Andersen, 1998).

Some authors (Rotella, 1985; Gordon, 1986; Gieck, 1990; Silva & Hardy, 1991) suggest that injured athletes progress through a grief cycle similar to that experienced by the terminally ill. In the treatment of injured athletes, they have therefore advocated the use of a stage model such as the one originally proposed by Kübler-Ross (1969). This approach does not, however, account for individual differences. Research to date has also not supported the major claims of stage models, and the notion of a stereotypical pattern of distinct emotional responses to loss has not stood up to empirical scrutiny (Brewer, 1994).

Cognitive appraisal models, in contrast to stage models, have been developed to account for individual differences in responses to sports injuries (Brewer, 1994). Some examples of cognitive appraisal models, which have relevance to psychological responses to injury, include: the transactional model of stress (Lazarus & Folkman, 1984); the psycho-physiological stress model (Weiss & Troxel, 1986) and the cognitive-emotional-behavioural model (Wiese-Bjornstal & Smith, 1993). In each of these models responses to injury are analysed in the context of the stress process. It is proposed that the way the athlete appraises his/her injury determines the emotional response which, in turn, is thought to affect the behavioural outcome. There are, however, little or no experimental or empirical data available to support the applicability of these models to the recovery process (Quinn & Fallon, 1999).
Until recently, only four empirical psychological prevention and thirteen empirical psychological rehabilitation intervention studies have been conducted (Durso-Cupal, 1998).

Consequently there is only a preliminary understanding of the complex interplay of psychological and physiological variables that contribute to prevention and rehabilitation of sports injuries. Current sports injury interventions, according to Durso-Cupal (1998), appear to be conceptually and theoretically primarily based on an amalgam of models advanced by Moos and Tsu (1977), Lazarus and Folkman (1984), Cohen and Wills (1985), Weiss and Troxel (1986) as well as Andersen and Williams (1988). Wiese-Bjornstal and Smith (1993) have probably made the most significant contribution to the theoretical foundation for psychological interventions with their integration of the Andersen and Williams (1988) pre-injury psychosocial model with the Wiese and Weiss (1987) stress model of injury.

According to Heil (1999), most of these theoretical models remain just that - theoretical. There are very few, if any, that provide a practical instrument for therapeutic use. Heil (1993) contends that medical treatment and rehabilitation interventions have a very important psychological impact on the athlete. Physicians and sports medicine specialists as such have unique roles to play in the rehabilitation process that incorporates psychological principles. Kolt (2000) shares this view. Most theoretical psychological rehabilitation intervention models, however, disregard the importance of physicians and sports medicine specialists. Heil (1993) suggests that injury is most effectively managed within a team approach, consisting of physicians, sports medicine specialists and psychologists, and which provide better continuity

of care as well as better quality of care.

By nature of their training sport psychologists are probably the best suited members of the sports medicine team to address an athlete's post-injury emotional responses (Pearson & Jones, 1992; Brewer, *et al.*, 1994; Crossman, 1997). However, access to sport psychologists is often limited or unavailable, and many athletes may be reluctant to accept formal psychological assistance. On the other hand, through their close involvement with injured athletes, physiotherapists might be very well suited to provide some form of psychological assistance (Gordon *et al*., 1991; Pearson & Jones, 1992; Kolt, 2000). In the past, the principal focus of physiotherapy management has been to help rehabilitating athletes return to their prior level of functioning by treating their overt physical problems. Recently, however, the sports medicine community in general has come to realise the integral role that psychosocial factors play in injury occurrence and the recovery processes (Brewer *et al.*, 1994). Some researchers (Pearson & Jones, 1992; Ninedek & Kolt, 2000) have realised the importance of preparing physiotherapists to deal with athletes experiencing psychological problems during treatment. A large paradigm shift to this way of thinking still has to be made.

FOCUS OF THIS STUDY

The objective of this paper is to contribute to the shifting of this paradigm by informing physiotherapists (in particular sport physiotherapists), of a practical psychological instrument that could be used in the treatment of injured athletes. This study focused on developing such an instrument that could assist physiotherapists in the identification, referral or treatment of injured athletes experiencing psychological problems. Certain criteria and the following aims were set. Firstly, the instrument had to be easy for physiotherapists to use without receiving any formal training. Secondly, the face value of the instrument had to be accepted by the individuals using it. Thirdly, it had to involve a minimum of additional work, above and beyond the normal tasks involved in treating patients. Lastly, it had to be effective in assisting athletes' rehabilitation from their injuries.

SELECTED ASSESSMENT INSTRUMENTS

According to Heil (1999), the level of emotional distress and the experience of pain are good indicators of how well rehabilitation is progressing. Therefore, in the development of an instrument, special attention needed to be paid to these two factors. For instance, the more extreme the emotional response relative to the injury and the more limited the athlete's coping resources, the greater the likelihood of treatment complications. Alternatively, pain as an immediate response to injury, reflects not only the severity of tissue damage, but also anxiety and expectations regarding the impact of injury on performance. Pain that appears to be out of proportion to the magnitude of the injury may signify a breakdown of coping mechanisms (Heil, 1993). Existing instruments were used such as the *Incredibly Short POMS*, (Dean *et al*., 1990) the Affective subscale of the *McGill Pain Questionnaire* (MPQ), (Melzack, 1975) the *Emotional Responses of Athletes to Injury Questionnaire* (ERAIQ) (Smith *et al*., 1990a) and others for assessing emotional distress as well as the experience of pain. Rather than use pen-and-paper response methods, current computer technology was employed.

Assessing emotional distress

One of the best ways to assess emotional distress is through the use of psychological tests. The purpose of psychological testing in injury is to help gather information about the athlete's personality style and coping skills. It also helps to determine how injury or other

circumstances have affected these personality styles and skills. Psychological testing provides a relatively concise, time efficient and objective measure of an athlete's functioning (Heil, 1993).

For the purpose of this study, the *Incredibly Short POMS* (ISP) (Dean *et al*., 1990) was used. The ISP was derived from the *Profile of Mood States* (POMS), originally developed by McNair *et al*. (1971). The POMS is an effective measure of mood states in athletes. Since Morgan (1980) popularised the use of the POMS in sports research, studies using the POMS have ranged from those done with individuals involved with fitness activity such as aerobics to Olympic athletes. A brief alternative to the POMS (that could be administered in less than 1 minute) was devised and is called the *Incredibly Short POMS* (ISP) (Dean *et al*., 1990). The ISP accurately gauges anxiety, depression, confusion, anger, energy levels and the validity does not differ much from that of the full version of the POMS (Meyers, 1999). Further research is being done on this instrument and it is now called the *Brief Assessment of Mood* (BAM), but nothing in this regard has yet been published.

Assessing the experience of pain

The tolerance of pain, in one form or another, is a routine aspect of sport performance for most athletes. However, even for athletes who show a remarkably good tolerance for performance pain, the pain of injury can be quite distressing (Heil, 1993). Pain and suffering, according to Jensen and Karoly (1992), are private, internal events that cannot be directly observed by clinicians or assessed via bioassays. Assessment of the pain experience is, therefore, frequently built upon the use of patient-selfreport. For the purpose of assessing pain, researchers have been forced to decontextualise the pain experience by separately addressing an individual's awareness of pain ("my arm hurts"), emotional reactivity ("the pain in my arm is killing me") and behavioural responses (the tendency to use the left arm when the right one hurts). Most researchers agree that at least three distinct dimensions of the pain

experience can be assessed in nearly all pain patient populations, namely, pain location, pain intensity and pain affect (Jensen & Karoly, 1992).

The instrument most frequently used to **assess pain location** is that of pain drawing. Pain drawing is a relatively simple diagnostic tool that allows pain sufferers to give a graphic representation of their pain. It provides information not readily evident in other forms of self-report and is especially useful for its clear portrayal of pain distribution through the body (Heil, 1993).

One of the most commonly used methods to **assess pain intensity** is a *Visual Analogue Scale (VAS)*. This scale consists of a line, usually 10 cm long, whose ends are labelled as the extremes of pain (*no pain* to *pain as bad as it could be*). Patients are asked to indicate which point along the line best represents their pain intensity. The measured distance from the *no pain* end to the mark made by the patient, is that patient's pain intensity score (Jensen & Karoly, 1992).

Assessing pain affect appears to be more complex than both pain location and pain intensity. Pain affect can be defined as the degree of activation, or changes in action readiness, caused by the sensory experience of pain (Jensen & Karoly, 1992). This arousal is often felt as distressing or frightening and can lead to interference in daily activities and habitual modes of response. Measures of pain affect do not appear to be as homogeneous as measures of pain intensity. They are less likely than measures of pain intensity to be strongly related to one

another, suggesting that the affective component of pain may consist of a variety of emotive reactions (Morley, 1989).

One of the most widely used measures of pain affect by far, is the "Affective" sub-scale of the *McGill Pain Questionnaire (MPQ)* developed by Melzack (1975). The MPQ recognises that pain consist of different dimensions. Responses to the questionnaire indicate both the sensory and emotional aspects of pain, which vary in different people at different times. Pain sufferers use words that show how much emotional distress is associated with their problem. In describing their pain, people can use words such as "it's horrible", or "it's wearing, depressing, or frustrating". This would give an insight as to how much pain has started to dominate the patient's life in terms of psychological distress.

CONSTRUCTION OF THE SPORTS INJURY MANAGEMENT (SIM) COMPUTER PROGRAMME

The aim of the SIM programme is twofold. Firstly, it creates a database for keeping a record of patients' biographical data. Secondly, it processes patient data from the different psychological tests in order to give a profile of the mood states and pain experiences of those patients. Comparison of subsequent profiles can then be used to assess whether an injured athlete has made any progress from one therapy session to the next.

Starting the programme

When starting the programme, an introductory screen is displayed. After five seconds this screen automatically defaults to the next "SIM Main Menu" screen. The therapist administering the programme then has the option of either selecting a new patient data file or

retrieving existing patient data. When the option "New Patient" is selected, the programme allows the therapist to create a new file for that patient.

For new patients, the patient's first name, surname and initials can be entered into the database. Based on this information, the programme creates a file for that specific patient. Additional information that can be entered, include current address, date of birth, height, weight and home and business telephone numbers.

Psychological profile

A psychological profile is compiled by using the following instruments: the *Emotional Responses of Athletes' to Injury Questionnaire* (ERAIQ), the *Incredibly Short POMS* (ISP), a Pain Drawing instrument, a Visual Analogue Scale (VAS) and the Affective subscale of the *McGill Pain Questionnaire* (MPQ).

The ERAIQ (Smith *et al*., 1990a) forms the basis of the first twenty questions of the computer programme. The original questionnaire has been adapted for the purposes of this programme. Questions one and two of this instrument offer the therapist an opportunity to gain insight into the athlete's values and priorities. The athlete can share sports-related, as well as academic or non-sport career goals. Athletes, who are tired, burned out, or alternatively burning with ambition, can often be identified through these two questions already. Question three permits the therapist a glimpse into the athlete's motivation for sport or exercise and heightens the therapist's appreciation of what is lost to the athlete when injury occurs. The questions on perceived goals, athleticism, patients' perception of the nature of the injury, pressures to

participate in sport and to perform to the expectations of others, stress and social support are mostly self-explanatory (Wiese-Bjornstal & Smith, 1993).

It is important to note that sometimes information omitted from the athlete's responses can be significant. For example, athletes suffering from an eating disorder or exercise addiction may frequently rank weight and stress management lowest on their list of motivators, perhaps in a conscious or unconscious effort to draw attention away from some major concerns and areas of discomfort (Wiese-Bjornstal & Smith, 1993).

For the purpose of **assessing pain location**, the scoring template for pain drawing developed by Margolis *et al*. (1986) was used. The instrument was adapted for use on the computer by allowing the patient to use the mouse to click on the areas affected. This will give an indication of where on or in the body the patient experiences pain. The *Visual Analogue Scale* (VAS) was chosen to give an indication of pain intensity, as it is easy to administer with a computer programme. Unlike a number on a scale that could be easily remembered, using the VAS would make it very difficult for a patient to remember the exact position on the line where he/she previously indicated his/her pain. This would contribute to obtaining an honest rating of the pain experienced, eliminating efforts to please the therapist. The Affective subscale of the *McGill Pain Questionnaire* was adapted for use in the programme. Patients can give an indication of the emotional pain experienced by selecting certain adjectives from lists of words.

Existing patients

As previously stated, the programme allows data of new patients, as well as of existing patients to be entered. This choice can be made on the "SIM Main Menu" input screen. As soon as the "Existing Patient" option has been selected on this particular screen, the "Existing Patient Menu" screen is opened. By executing the "Load Patient Data" option on that screen, the therapist can select the file of any previous patient for further therapy sessions. If any of the selected patients' biographical data have changed, the option "Change/View Patient Biographical Data" can be selected and the data altered. If no alterations need to be made, the therapist can proceed directly to the "Next Test" option on that screen. The test data from previous sessions for that particular patient will be displayed on the same screens and any of this data can be changed at this point. After the completion of each therapy session, the therapist can either display the patient's psychological profile on the computer monitor, or print the profile.

Scripts

Provision was made for scripts, or handouts, that can be given to the patient after each treatment session. These scripts might vary from general information on the role of the sport psychologist in the management of injuries, to more specific information on for instance mental imagery, goal setting, rehabilitation adherence, keeping of a homework log, or any information relevant to the rehabilitation of the specific athlete. After the completion of each session, the therapist may either select a particular script thought appropriate for the patient at that time, or scripts may be generated by default. This is done on the "Scripts" screen of the programme.

FEEDBACK ON PROGRAMME (SIM)

Injured athletes may choose to rehabilitate on their own, but usually within the rehabilitation

setting there are at least two parties involved, namely the party receiving treatment and the party administering the treatment. Although the aim of rehabilitation is complete recovery, it would probably be safe to say that the perspectives of the two parties involved in reaching that objective may differ slightly. To make provisions for these differences in perspectives, the effectiveness of the programme was evaluated firstly from the therapists' and secondly from the injured athletes' points of view. For this purpose two very simple questionnaires were developed.

In the development of the questionnaires, the following questions were asked: (1) How easy/difficult was the SIM computer programme to use? (2) How useful was the SIM computer programme in helping you/your patient rehabilitate from injury? (3) Would you recommend the use of the SIM computer programme to other athletes/other therapists? (4) What aspects of the SIM computer programme did you like? (5) What aspects of the SIM computer programme did you dislike? Lastly, both patients and therapists had the opportunity to make any other comments or suggestions.

RESPONSE TO FIRST THREE QUESTIONS

Question	**Response options**	**Patients** (N=17)	**Therapists** (N=9)
How easy/difficult was the SIM computer programme to use?	Very easy	65%	67%
	Easy	24%	22%
	Moderately difficult	11%	11%
How useful was the SIM computer programme in helping you/your patient rehabilitate from the injury?	Very useful	41%	67%
	Useful	35%	11%
	Moderately useful	24%	22%
Would you recommend the use of the SIM computer programme to other athletes/therapists?	Very definitely	42%	100%
	Strongly inclined	29%	
	Moderately inclined	29%	

Patient feedback

It is important to receive feedback from patients using the SIM programme, because the success of the programme largely depends on whether patients perceive it as helpful in their rehabilitation, or whether they perceive it as a hindrance. The extent to which they see it as helpful, will determine how quickly it is accepted as an integral part of their rehabilitation process. Seventeen athletes took part in this study and the following feedback was received from them.

On the first question, 65% of the injured athletes indicated that they found the programme very easy to use, 24% indicated that it was easy to use and the remaining 11% found it moderately difficult to use. On the second question, 41% injured athletes found the programme very useful in their rehabilitation, a further 35% found the programme useful in helping them rehabilitate from their injury and the remaining 24% found the programme moderately useful. In answering the third question, 41% very definitely felt they would

recommend the programme to other rehabilitating athletes, 29% injured athletes felt moderately inclined to recommend the programme to other athletes and the remaining 29% felt a bit stronger about recommending the programme. Feedback on the fourth question ranged from statements to the effect that in using the programme the athletes had become more aware of their injuries, it made them more aware of their rehabilitation and the progress they were making to statements that it helped keep them positive about the whole process. On the fifth question, patients' feedback included that they thought some of the questions were too personal and that it was difficult to use the programme where more than one injury was present.

Patients also had the opportunity to make other comments and suggestions regarding the programme. Some thought that it would be better if the therapist was involved with the entering of the data, while others had comments on the structure of the programme and how they would like to have it altered to suit their needs.

Therapist feedback

As with feedback from patients, it is equally (if not more) important to receive feedback from the therapists using the programme. The programme was developed with physiotherapists in mind, so it stands to reason that if the feedback received was largely negative, the goal of the programme had not been achieved. Nine therapists took part in the programme and the following feedback was received: On the first question, 66% of the therapists found the programme either very easy or easy to use, while only 11% found it moderately difficult to use. Feedback received on the second question revealed that 66% therapists found the SIM programme moderately helpful in helping their patients rehabilitate from injury, while 22% therapists found it very useful. When asked whether they would recommend the use of the programme to other therapists, all the therapists indicated that they would either moderately or strongly recommend the programme. Answers to the fourth question ranged from comments that the programme would help reinforce the positive effects of each treatment session, that the graphic representation was useful in gauging progress to the fact that the programme gives injured athletes the opportunity to quantify their pain experience.

The main concerns of the therapists in giving feedback on the fifth question, was that the administration of the programme might impede the time available for physical rehabilitation. This also led them to recommend in their answers to the sixth question, that the programme should be further condensed, or that provision be made to administer the programme through pencil and paper tests. In general it would seem that both injured athletes and physical therapists alike who participated in this study received the SIM programme favourably. When taking into consideration that the programme was to a very large extent only a prototype, the feedback indicates that the SIM programme definitely has huge potential to be of value in the rehabilitation of injured athletes. Recommendations made by both the athletes and the therapists will be incorporated in a subsequent version of the programme.

COMMENTS

Criticism that can be levelled against most of the models for the psychological rehabilitation of sports injuries would be that they remain mostly theoretical models. Very few, if any, of these models seem to provide a physical therapist interested in using psychological principles in injury rehabilitation a ready-made instrument for that purpose. An attempt was made in the development of this instrument to rectify this impasse by creating an instrument that might be used even after minimal training.

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FISIEKE AKTIWITEIT SE VERBAND MET LEEFSTYL EN GEESTELIKE WELSTAND BY SUID-AFRIKAANSE DAMES

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ABSTRACT

The physical activity profile and to a certain extent also the spiritual well-being of men is well documented in research. The same could however not be said about women. This study therefore aimed to research some part of the South African women population between the age of 30-65 years of age. The respondents comprised of 388 (43.0±9.6 years) Caucasian women, who were randomly selected, in an urbanised community. Data regarding demographic information, physical activity participation and spiritual well-being (SWB) were collected from the respondents. The respondents were selected in two age groups (30-49 and 50-65 years) representing predominantly the pre- and post-menopausal life stages of women. The relationship of the spiritual well-being and physical activity was evaluated by means of a one-way and two-way analysis of variance. From the descriptive data it is clear that the majority (49%) of the respondents were physical inactive. Furthermore the younger group (30-49 year) tend to be more physically active than the older group (50-65 year). The post-menopausal women tend to follow a healthier lifestyle than the pre-menopausal women do. Spiritual well-being showed a significant ($p \leq 0.05$) relationship with physical activity. Significant ($p \leq 0.05$) difference existed between the physical activity index (FAI) of pre- and post-menopausal women, as far as lifestyle (LSBB & LSW) and existential well-being (EW) is concern. A highly practical significant (ES ≥0.8) difference existed between high active- and inactive pre- and post-menopausal women in terms of their lifestyle indexes (LSBB & LSW). Physical activity contributes significantly to the existential well-being (EW) ($p \leq 0.01$) and spiritual well-being (SWB) ($p \leq 0.001$) of women.

Key words: Physical activity; Spiritual well-being; Lifestyle; Pre-menopausal; Post-menopausal; Women.

INLEIDING

Die vraag rakende die verbande tussen fisieke aktiwiteit, geestelike welstand en gesondheid word tans wyd gedebatteer (Dreyer & Dreyer, 2001:143). Die invloed wat gereelde deelname aan fisieke aktiwiteit op die gesondheid van die mens uitoefen, is reeds deeglik nagevors (Blair *et al*., 1994; Drinkwater, 1994; Joubert, 1995; Blair *et al*., 1996; Strydom *et al*., 1996; Dreyer *et al*., 1997; Van der Westhuizen *et al*., 2001; Wilders *et al*., 2001), dog die invloed wat veranderlikes soos leefstyl en veral geestelike welstand op die verbande kan hê, gee 'n nuwe dimensie aan die bekende begrippe en minder inligting bestaan hieroor. In dié verband

[1] Erkenning word verleen aan die bydrae van Lukas Dreyer en Henry Eagleton.

beweer Sweeting (1990) dat die geestelike dimensie 'n belangrike bepaler van norme en waardes is - wat dus ook 'n bepaalde invloed op leefstyl kan hê (Van der Merwe, 1997) en wat sodoende ook die gesondheidstatus kan beïnvloed. Die konsep van geestelike welstand bestaan nie net uit die religieuse nie, maar omsluit ook die psigososiale dimensie van die mens (McMillen, 1968:187; Ellison, 1983:331; Ross, 1995; Dreyer & Dreyer, 2001:142).

Volgens Ellison (1983) bestaan geestelike welstand uit 'n vertikale en 'n horisontale verhouding (Ross, 1995). Hierdie verhoudings omsluit komponente wat dui op die lewe in verhouding met God, die self, die gemeenskap en omgewing met die volheid van die lewe as einddoel (Ellison, 1983:331). Die vertikale verhouding verteenwoordig die kwaliteit of persepsie van die verhouding van 'n persoon tot sy Skepper (religieuse). Die horisontale verhouding daarteenoor vervat die individu se persepsie van die betekenis en doel van die lewe en staan ook baie sterk in verhouding tot die medemens (sosiale) (Simington, 1996). Eagleton (1992:73) voer aan dat die mens sy waarde ontdek in 'n betekenisvolle verhouding met God en sy medemens.

Dit blyk derhalwe dat die individu se geestelike dimensie nie 'n losstaande entiteit is nie, maar 'n integrale deel van die menslike bestaan vorm. Met hierdie integrasie in gedagte beskou sommige skrywers dan ook geestelike welstand as die basis van totale welstand (Ellison, 1983:332; Hawks *et al*., 1995:377; Ross, 1995:457; Van der Merwe, 1995:63; Dreyer & Dreyer, 2001).

Volgens Van der Merwe (1997:113) vertoon fisieke aktiwiteit positiewe verbande met geestelike welstand (GW) asook met religieuse (RW) en psigososiale welstand (PSW). In dié verband het Rabie (1999:92) bevind dat die geestelike welstand (GW) van dames betekenisvol ($p \leq 0.05$) met 'n inoefeningsprogram verbeter het. Die kontrolegroep het egter verswak in die dienooreenkomstige periode, aldus Rabie (1999:92). Rabie (1999:93) skryf hierdie verskil toe aan die moontlike invloed wat liggaamsgewig in die hele proses van selfverwesenliking speel. Zorn en Johnson (1996:209) het bevind dat religieuse welstand (RW) veral 'n belangrike komponent van gesondheid by ouer dames is, omrede dit 'n belangrike sosiaal-ondersteunende faktor is wat gepaardgaan met hoop vir die toekoms (Zorn & Johnson, 1996:215-217).

Vorige navorsing het aangetoon dat geestelike welstand in samewerking met die ander welstandskomponente soos die emosionele, fisieke, beroep ens. belangrike konstrukte by mans is en gevolglik hul totale welstand/gesondheid kan beïnvloed (Van der Merwe, 1995:63; Dreyer & Dreyer, 2001). Soortgelyke navorsing kon egter nie gevind word ten opsigte van dames nie. Dit is derhalwe belangrik om dit ook by dames na te vors, aangesien dit bekend is dat dames nie noodwendig soos mans op fisieke aktiwiteit reageer nie (Joubert, 1995:111).

Die eerste gedeelte van hierdie studie verskaf ’n profiel van die fisieke aktiwiteit, leefstyl en geestelike welstand van die dames betrokke by die ondersoek. Die vraag wat dus met hierdie studie beantwoord wil word, is of fisieke aktiwiteit enige verband, nadat ouderdom in berekening gebring is, met leefstyl en geestelike welstand van dames, vertoon. Antwoorde op hierdie vraag behoort belangrike inligting te verskaf rakende die fisieke aktiwiteit-, leefstyl- en geestelike welstandstatus by dames, asook watter onderlinge verband daar tussen die parameters bestaan. Sodoende kan belangrike riglyne vir intervensieprogramme vir dames bekom word.

METODES EN PROSEDURES

Prosedures

Die blanke woongebiede binne die munisipale grense van Potchefstroom is in 11 streke verdeel, wat weer verder in 22 blokke onderverdeel is. Hierdie 22 blokke het elk uit ongeveer 150-200 woonhuise bestaan, waarvan slegs die huise met ongelyke straatadresse gebruik is. Die inligting is deur die nagraadse studente van die Skool vir Biokinetika, Rekreasie en Sportwetenskap aan die Potchefstroomse Universiteit vir Christelike Hoër Onderwys (PU vir CHO) ingesamel. Die studente is deeglik vooraf opgelei vir die insameling van die gegewens en het hulp verleen met die voltooiing van die vraelyste. Drie-honderd-agt-en-tagtig (388) respondente se data is verwerk vir die doeleindes van hierdie studie.

Vraelyste

Die vraelys van Sharkey (1997) is gebruik om die fisieke aktiwiteitsprofiel van die respondente in hierdie studie te bepaal. Hiervolgens word deelname aan fisieke aktiwiteit as ’n indeks uitgedruk deur ’n numeriese waarde aan die inoefeningsvereistes toe te ken. Die totale fisieke aktiwiteitsindeks (FAI) is verkry deur intensiteit, duur en frekwensie van deelname, met mekaar in berekening te bring. Na die berekening van die indeks is die respondente in drie groepe verdeel, naamlik ’n indeks van ≤16 is as laag aktief geklassifiseer, tussen 17 en 44 as matig aktief, terwyl respondente met ’n indeks van ≥45 as hoog aktief geklassifiseer is. Die fisieke aktiwiteitsprofiel van Sharkey (1984:5) is al suksesvol in verskeie vorige studies gebruik (Strydom *et al*., 1991:65-76; Van der Merwe, 1995:36; Van der Westhuizen, 1997:175-178; Boshoff, 1998:33; Fourie, 1999:46; Rabie, 1999:45-46).

Die leefstylvraelys van Belloc en Breslow (1972:409-421) is gebruik om respondente se leefstyl te kategoriseer. Hulle het sewe eenvoudige leefstylgewoontes geïdentifiseer, naamlik die eet van drie maaltye per dag op gereelde tye met geen versnaperinge tussenin; voldoende slaap van 7-8 ure per nag; daaglikse ontbyt; geen sigarette of pyp rook nie; deelname aan fisieke aktiwiteit 2-3 keer per week; min of geen alkoholinname en die handhawing van 'n konstante liggaamsmassa. Respondente wat drie of minder (≤3) van hierdie gewoontes gevolg het, se leefstyl is as swak (ongesond) geklassifiseer, diegene wat vier tot vyf (4-5) gewoontes gevolg het, is as matig geklassifiseer – terwyl diegene wat ses tot sewe (6-7) gewoontes gevolg het as goed (gesond) geklassifiseer is. Die leefstylvraelys van Belloc en Breslow (1972:401-421) is al in verskeie vorige navorsingstudies gebruik (Dreyer *et al.*, 1997:16-17; Fourie, 1999:49-50).

Die leefstylvraelys van Walker *et al*. (1987:76-78) is gebruik om die geneigdheid van individue tot gesondheidsbevorderende gedrag te bepaal. Die leefstylvraelys bestaan uit agt-en-veertig (48) vrae, waarvolgens respondente elke vraag op ’n Likertskaal (1-4) beantwoord.

Hiervolgens word die totale leefstylwaarde vervat in ses (6) subskale, naamlik selfaktualisering, oefening, mediese selfsorgsaamheid, spanningsbeheer, voeding en interpersoonlike ondersteuning. Nadat die totale leefstylwaarde bereken is, is die respondente in drie groepe volgens bepaalde groepverspreidings, verdeel. Respondente met 'n leefstylwaarde van kleiner of gelyk aan die twintigste persentiel (20%) is as swak (ongesond) geklassifiseer, 'n leefstylwaarde tussen die een-en-twintigste persentiel (21%) en die nege-en-sewentigste persentiel (79%) as matig en gelyk aan of hoër as die tagtigste persentiel (80%),

as goed (gesond) geklassifiseer. Heelparty navorsing het al gebruik gemaak van Walker *et al.* se vraelys (Walker *et al*., 1987:76-90; Oleckno & Blacconiere, 1991:819-826; Van der Merwe, 1997:118-120).

Die geestelike welstandvraelys van Ellison (1983:340) is gebruik om die gesindheid en belewenis van die individu met betrekking tot geestelike welstand te bepaal. Die vraelys bestaan uit twintig (20) vrae wat volgens 'n Likertskaal (1-6) beantwoord moet word. Die ongelyke vraagnommers verteenwoordig 'n subskaal wat as religieuse welstand (RW) bekend staan terwyl die tweede subskaal wat as die psigososiale welstand (PSW) bekend staan, volgens die gelyke vraagnommers bepaal word. Die religieuse (RW) en psigososiale welstand (PSW) vorm saam geestelike welstand (GW) (RW+PSW=GW). Respondente met 'n geestelike welstandswaarde van kleiner of gelyk aan die twintigste persentiel (20%) is as laag geklassifiseer, 'n waarde tussen die een-en-twintigste persentiel (21%) en die nege-en-sewentigste persentiel (79%) as matig en gelyk aan of hoër as die tagtigste persentiel (80%) is as hoog geklassifiseer. Die geestelike welstandvraelys is al met groot welslae in vorige navorsing gebruik (Van der Merwe, 1997; Rabie, 1999; De Klerk, 2001).

Statistiese prosedures

Die CSS:STATISTICA-rekenaarpakket aan die Potchefstroomse Universiteit vir Christelike Hoër Onderwys (PU vir CHO) is gebruik vir die statistiese verwerking. Die verband tussen fisieke aktiwiteit, leefstyl en geestelike welstand is bepaal met behulp van eenrigtingvariansie- en tweerigtingvariansie-analises asook 'n stapsgewys-meervoudige regressie-analise. Nadat statistiese betekenisvolheid bepaal is, is die Newman-Keuls post hoc-toets (Thomas & Nelson, 1990:144) gebruik om te bepaal watter groepe betekenisvol van mekaar verskil. Die praktiese betekenisvolheid van verskille wat statisties betekenisvol van mekaar verskil het, is bereken volgens die formule van Cohen se effekgrootte-berekening (EG). Hoog prakties betekenisvolle verskille is bereken op effekgrootte (EG≥0.8) (Thomas & Nelson, 1990).

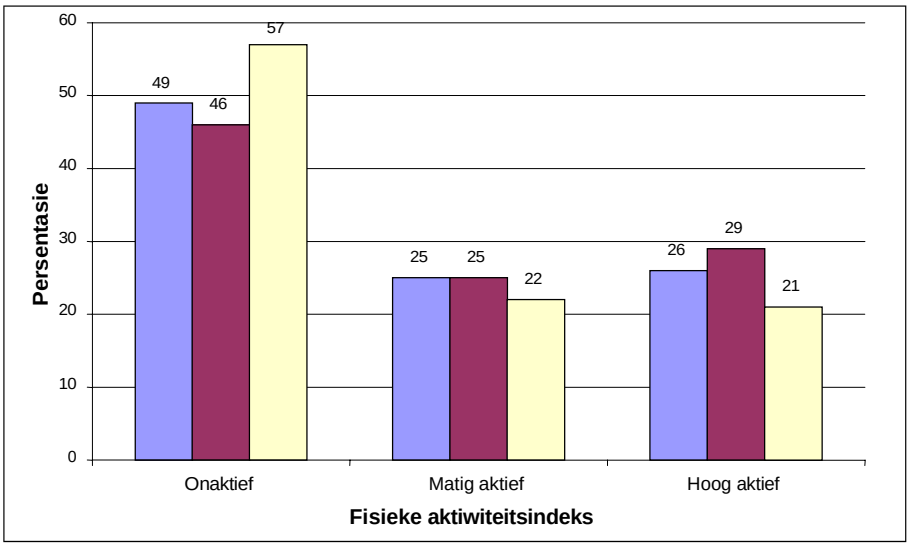
RESULTATE

Die beskrywende statistiek van die ondersoekpopulasie met betrekking tot die parameters wat in hierdie studie gebruik is, word in Tabel 1 weergegee.

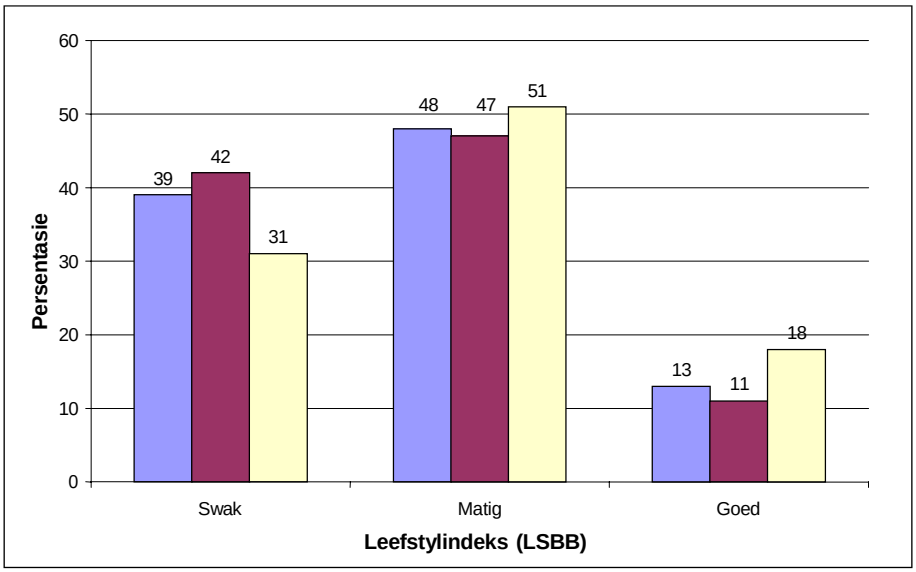
In Figuur 1 word die verspreiding van die totale groep, pre- en postmenopousale dames ten opsigte van hul deelname aan fisieke aktiwiteit, grafies voorgestel. Die respondente is in drie groepe volgens die fisieke aktiwiteitsindeks geklassifiseer. Figuur 2 weerspieël die leefstylgroeperings volgens Belloc en Breslow (LSBB) en is in swak (<4), matig (4-5) en goeie lewenstyl (6-7) verdeel.

Die leefstylindeks, volgens Walker *et al*. (1987) (LSW), van die totale, pre- en postmenopousale populasie is opgedeel in laag (<21), matig (21-79%) en hoog (79%>) en word in Figuur 3 weergegee. Figuur 4 bied die profiel van die geestelike welstandindeks by

die proefgroep aan, wat opgedeel is in laag (<21), matig (21-79%) en hoog (79%>).



FIGUUR 1. **DIE VERSPREIDING VAN DIE TOTALE GROEP (A) ASOOK DIE PRE- (B) EN POSTMENOPOUSALE (C) GROEP SE FISIEKE AKTIWITEITSINDEKS**



FIGUUR 2. **DIE VERSPREIDING VAN DIE TOTALE (A), PRE- (B) EN POSTMENOPOUSALE (C) GROEP SE LEEFSTYLINDEKS VOLGENS BELLOC EN BRESLOW (LSBB)**

TABEL 1. **BESKRYWENDE STATISTIEK MET BETREKKING TOT OUDERDOM, LEEFSTYL, FISIEKE AKTIWITEIT, PSIGOSOSIALE WELSTAND, RELIGIEUSE EN GEESTELIKE WELSTAND**

Veranderlikes	**N**	**RG**	**Minimum**	**Maksimum**	**SA**
Ouderdom	388	43.0	30.0	65.0	9.6
Leefstyl Belloc & Breslow (LSBB)	388	3.9	1.0	7.0	1.3
Leefstyl Walker *et al*. (LSW)	388	186.2	88.0	276.0	30.7
Fisieke aktiwiteitsindeks (FAI)	388	27.0	0.0	190.0	29.0
Psigososiale welstand (PSW)	388	41.5	18.0	55.0	5.8
Religieuse welstand (RW)	388	52.5	24.0	60.0	7.4
Geestelike welstand (GW)	388	94.0	51.0	110.0	11.5

TABEL 2. **DIE ONDERLINGE VERBAND TUSSEN DIE FISIEKE AKTIWITEITINDEKS VAN PRE- EN POSTMENOPOUSALE DAMES MET LEEFSTYL, PSIGOSOSIALE WELSTAND, RELIGIEUSE WELSTAND EN GEESTELIKE WELSTAND**

	Premenopousale dames									**Postmenopousale dames**								
	(a) Laag aktief			**(b) Matig aktief**			**(c) Hoog aktief**			**(d) Laag aktief**			**(e) Matig aktief**			**(f) Hoog aktief**		
Indeks	**N**	**RG**	**SA**	**N**	**RG**	**SA**	**N**	**RG**	**SA**	**N**	**RG**	**SA**	**N**	**RG**	**SA**	**N**	**RG**	**SA**
LSBB	137	3.3 b,c+,f +	1.3	81	4.0 a	1.3	93	4.3 a+	1.3	54	3.9	1.3	21	4.3	1.7	21	4.7 a+	1.3
LSW	137	173 b,c+,f+	30.7	81	187 a,c	24.0	93	203 a+,b,d	27.2	54	180.3 c	34.9	21	184.1	23.1	21	202.9 a+	27.7
PSW	137	40.1 c	7.6	81	41.7	7.3	93	43.4 a,d	4.6	54	38.6 c	8.6	21	40.4	5.6	21	42.0	7.1
RW	137	51.2	9.6	81	51.6	9.5	93	54.3	6.5	54	51.1	10.1	21	51.8	8.7	21	49.1	9.8
GW	137	91.3	16.1	81	93.3	15.1	93	97.7	9.6	54	89.8	17.1	21	92.2	13.0	21	91.1	14.5

Statisties betekenisvolle verskille ($p \leq 0.05$) word aangedui deur die ooreenkomstige letter (a,b,c, ens.) by die gemiddelde waardes van die afsonderlike parameters. Die + dui aan dat die verskil ook hoog prakties betekenisvol ($EG \geq 0.8$) is.

Uit Tabel 2 blyk dit dat fisieke onaktiwiteit ’n rol kan speel by die premenopousale dame met betrekking tot bepaalde welstandparameters. Dit blyk dat die fisiek laag aktiewe groep se leefstylindeks (LSBB en LSW) betekenisvol verskil van die hoog aktiewe groep. So ook toon die psigososiale welstandindeks ook ’n betekenisvolle verskil tussen die fisiek laag aktief en

hoog aktiewe groep. Wat die religieuse welstandindeks betref, kom geen betekenisvolle verskil voor tussen bogenoemde premenopousale aktiwiteitsgroepe nie. Dieselfde geld ook vir die geestelike welstandindeks. Laasgenoemde indeks is 'n samevoeging van die psigososiale en religieuse welstandsindekse en omdat daar geen betekenisvolle verskil tussen die religieuse welstand tussen die twee groepe bestaan nie, word die tendens in die saamgestelde indeks (geestelike welstand) ook weerspieël.

TABEL 3. **STAPSGEWYS-MEERVOUDIGE REGRESSIE-ANALISE VAN GW, PSW EN RW SE VERBAND MET LEEFSTYL, OUDERDOM EN FISIEKE AKTIWITEIT**

Indeks	Parameter	Kumulatiewe R	Kumulatiewe R^2	Bydrae tot R^2	F-waarde
GW	Fisieke aktiwiteit	0.141	0.020	0.020	8.297**
	Ontbyt eet	0.186	0.035	0.015	6.281**
	Ouderdom	0.210	0.044	0.010	4.152*
	Maaltye	0.225	0.051	0.006	2.735
	Rook	0.239	0.057	0.006	2.778
	Slaap	0.249	0.062	0.005	2.045
	Alkoholverbruik	0.256	0.065	0.004	1.620
PSW	Fisieke aktiwiteit	0.177	0.031	0.031	13.316***
	Ontbyt eet	0.231	0.053	0.022	9.460**
	Ouderdom	0.255	0.065	0.012	5.266*
	Massa	0.267	0.071	0.006	2.602
	Rook	0.276	0.076	0.005	2.095
	Slaap	0.284	0.081	0.005	2.149
	Eet	0.290	0.084	0.003	1.489
RW	Eet	0.113	0.013	0.013	5.300*
	Rook	0.145	0.021	0.008	3.47
	Oefen	0.166	0.028	0.007	2.804
	Ouderdom	0.181	0.033	0.005	2.147
	Alkoholverbruik	0.191	0.037	0.004	1.597
	Ontbyt	0.199	0.039	0.003	1.209
	Slaap	0.206	0.043	0.003	1.317

*= $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Wat die ouer groep dames betref (postmenopousaal), kom daar geen betekenisvolle verskille tussen die verskillende aktiwiteitsgroepe voor nie. Wanneer die verskillende aktiwiteitsgroepe van die pre- met die postmenopousale groep met mekaar vergelyk word, kom daar geen betekenisvolle verskille in die ooreenstemmende groepe voor nie. Die stapsgewysmeer-

voudige regressie-analise van PSW, RW en GW se verband met leefstyl (LSBB-LSW), ouderdom en fisieke aktiwiteit word in Tabel 3 weergegee.

BESPREKING VAN RESULTATE

Effektiewe deelname aan fisieke aktiwiteit wat voldoende is om gesondheidsvoordele uit te lok, impliseer ’n fisieke aktiwiteitindeks (FAI) van 36 en hoër, volgens Sharkey se aktiwiteitsindeks (Van der Merwe, 1997:127; ACSM, 2000). Die gemiddelde FAI van die dames is 27.0 (Tabel 1) wat daarop dui dat die oorgrote meerderheid van die dames relatief laag aktief is. Laasgenoemde tendens blyk ook duidelik uit Figuur 1, wat aantoon dat onderskeidelik 46% en 57% van die pre- en postmenopousale dames fisiek laag aktief is. Hierdie tendens stem ooreen met vorige navorsing wat gedoen is op dames en waar ’n FAI van 16.33 en 22.69 respektiewelik gevind is (Rabie, 1999; Schlebusch, 2000). Die variasie in laasgenoemde kan moontlik toegeskryf word aan ’n diversiteit asook aan die grootte van die proefgroepe. ’n Lae FAI kan bepaalde gesondheidsrisiko’s impliseer, veral geïnterpreteer teen die agtergrond dat fisieke onaktiwiteit as ’n primêre risikofaktor vir koronêre hartvatsiektes beskou kan word (ACSM, 2000:24) asook dat dit as ’n belangrike oorsaak vir chroniese siektestoestande beskou word (McGinnis, 1992:S196-S199).

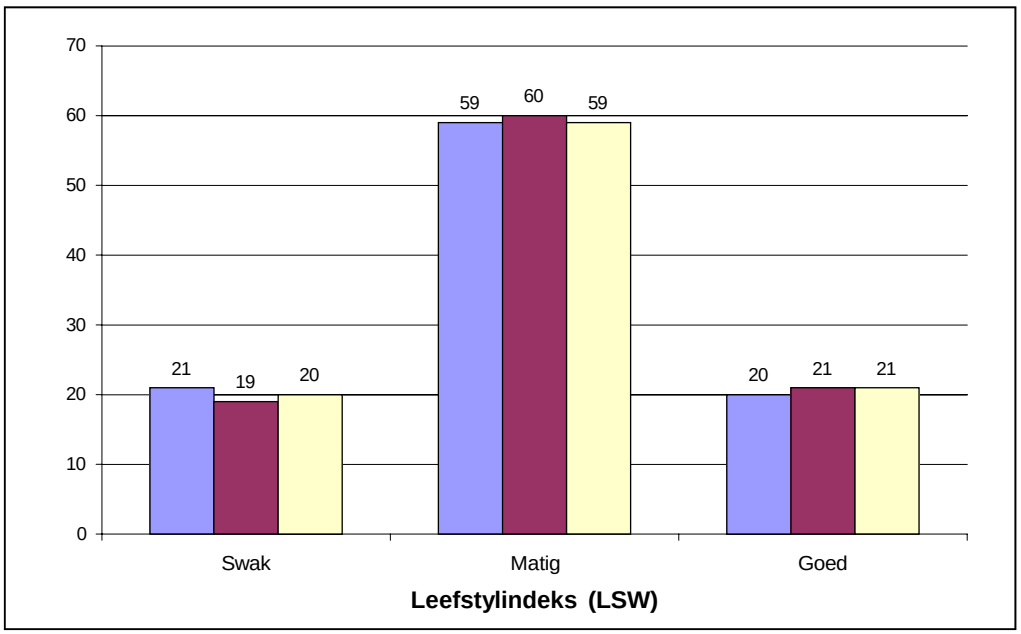
Die gemiddelde waardes van die dames se RW–52.5, PSW–41.5 en GW–94.0 (Tabel 1) stem ooreen met die navorsing van Letbetter *et al.* (1991) se mans en vrouens (RW–50.83, PSW–49.2 en GW–101.08), Van der Merwe (1997) se mansproefgroep (RW–51.28, PSW–46.80 en GW–98.27) en Rabie (1999) se damesproefgroep (RW–51.57, PSW–48.14 en GW–99.51) onderskeidelik. Omrede GW uit RW en PSW bestaan, kan die swakker PSW van die dames in hierdie studie die laer GW tot gevolg hê. Die betekenis en sinvolheid van die lewe word vervat in die geestelike reis van die mens en gevolglik kan ’n wanbalans van die geestelike dimensie ander aspekte van die lewe beïnvloed (Anderson, 1995:85). Die dame met ’n swakker PSW kan sodoende substitute kry vir byvoorbeeld ’n swak selfgeaktualiseerdheid. Religie word beskou as ’n hanterings-meganisme en speel ’n al hoe groter rol met die toename in ouderdom (Pagament *et al*., 1995). Hiermee saam kan dames met ’n swak selfwaarde ongesonde leefstylpraktyke volg soos byvoorbeeld sigaretrook, onaktiwiteit ens. ’n Swak leefstyl saam met onaktiwiteit kan nadelige gevolge inhou vir gesondheid en lei tot onder andere kardiovaskulêre probleme, hipertensie en hipercholesterolemie (Strydom *et al.*, 2001). Dit is reeds aangetoon dat mans met ’n swakker PSW minder geneig is om fisiek aktief te wees met gevolglik bepaalde gesondheidsimplikasies (Dreyer & Dreyer, 2001).

Intrinsieke religieuse oortuigings voorsien ’n universele eenheidsoriëntasie wat ander motiverings en verhoudings insluit, aldus Krause (1979). Ross (1995:458) is van mening dat geen ander dimensie van totale welstand tot sy volle kapasiteit en hoogste kwaliteit kan ontwikkel sonder geestelike welstand nie. Die geestelike welstandsprofiel (Figuur 4) van die proefgroep vertoon ’n normale verspreiding van data met ’n effens negatiewe kurtose. Hierdie verspreiding stem ooreen met vorige navorsing van Ellison (1983) en Van der Merwe (1997).

Die gemiddelde leefstylindekse volgens Tabel 1, naamlik 3.9 (LSBB) en 186.2 (LSW) dui op ’n swak (LSBB) tot ’n gemiddelde leefstylstatus (LSW), wat deur dames gevolg word. Hierdie resultate stem grootliks ooreen met vorige navorsing van Fourie (1999:57) 4.19 (LSBB) en Van der Merwe (1997) 183.47 (LSW). Dit wil voorkom of die postmenopousale dames (Figuur 2) geneig is om ’n gesonder lewenstyl te handhaaf as die premenopousale groep.

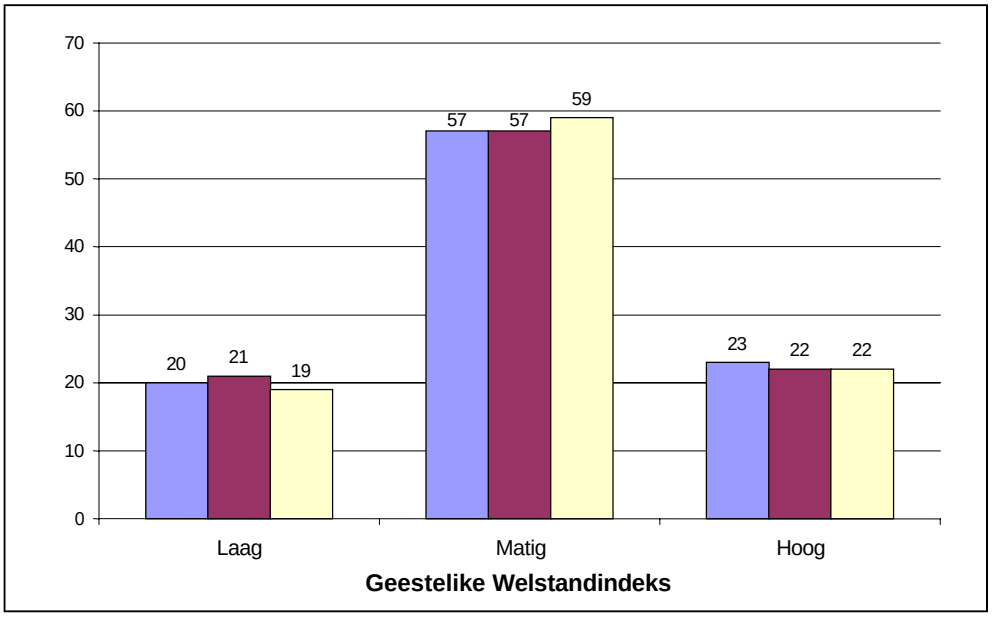
Hierdie tendens kan waarskynlik toegeskryf word aan leefstylaanpassings as gevolg van toename in ouderdom en gepaardgaande gesondheidsprobleme. Die premenopousale dames, as gevolg van hul diverse rolverdeling as moeder, huisvrou, eggenote en as deelgenoot-

broodwinner beleef 'n veeleisende taak en kan dikwels nie alles gedoen kry nie. Hierdie situasie kan moontlik neerslag vind in die swakker leefstyl (Figuur 2) wat as gevolg van 'n tydsprobleem kan ontstaan. Aan die ander kant kan die hormonale beskermingseffek van die premenopousale dame ook bydra tot 'n minder gesondheidsbewuste leefstyl, omdat die gevaar van kardiovaskulêre siektes gewoonlik in die media op die man geprojekteer word (Carbon, 1992:476).



FIGUUR 3. **DIE VERSPREIDING VAN DIE TOTALE (A), PRE- (B) EN POST-MENOPOUSALE (C) GROEP SE LEEFSTYLINDEKS (Walker *et al.*)**

Volgens Figuur 4 vertoon die geestelike welstand van beide groepe 'n min of meer eweredige verspreiding. In aansluiting hiermee word daar in Tabel 2 geen betekenisvolle verskille tussen die twee groepe (pre- en postmenopousaal) dames gevind wanneer hul FAI, RW en GW in verband met mekaar gebring word nie. Ten opsigte van LSBB en LSW bestaan prakties betekenisvolle (EG≥0.8) verskille tussen laag aktiewe (premenopousaal) en hoog aktiewe (pre- en postmenopousale) dames. Statisties ($p \leq 0.05$) betekenisvolle verskille is gerapporteer tussen die laag aktief, matig en hoog aktiewe premenopousale dames ten opsigte van LSW. Die laag aktief pre- en postmenopousale dames se PSW verskil statisties ($p \leq 0.05$) betekenisvol van die hoog aktiewe premenopousale dames. Die laag aktiewe premenopousale dames verskil statisties ($p \leq 0.05$) betekenisvol van slegs die hoog sowel as die matig aktiewe groep met betrekking tot LSW. Ten opsigte van LSBB by die premenopousale dames, vertoon laag aktiewe respondente statisties ($p \leq 0.05$) betekenisvolle verskille met die matig sowel as die hoog aktiewe groep. Hieruit blyk dit dus dat deelname aan fisieke aktiwiteit 'n betekenisvolle effek op die leefstyl van dames het.



FIGUUR 4. **DIE VERSPREIDING VAN DIE TOTALE (A), PRE- (B) EN POST-MENOPOUSALE (C) GROEP SE GEESTELIKE WELSTANDINDEKS**

Volgens Tabel 3 word die bydrae van aktiwiteit tot geestelike welstand op 2.0% bereken terwyl die totale bydrae van LSBB slegs 6.5% is. Vir die dame anders as die man (Van der Merwe, 1997:165) dra ouderdom deurgaans by as ’n belangrike bepaler van die dame se geestelike welstand (Tabel 3). Ten opsigte van LSBB-meetinstrument dra aktiwiteit (2% en 3.1%) en ouderdom (1% en 1.2%) by tot geestelike en psigososiale welstand respektiewelik. Die ander bydraes verteenwoordig 11.3% van die totale bydrae. Fisieke aktiwiteit lewer dus die belangrikste bydrae tot geestelike welstand en psigososiale welstand volgens LSBB.

GEVOLGTREKKING

Uit die resultate blyk dit dat deelname aan fisieke aktiwiteit ’n betekenisvolle rol kan speel by enkele welstandparameters by premenopousale dames. In die opsig blyk deelname aan fisieke aktiwiteit ook ’n snellermeganisme te wees wat daartoe aanleiding gee dat premenopousale dames geneig is tot ’n gesonder leefstyl. Die tendens kom ook by die ouer dames voor, dog die verskille is nie betekenisvol nie. Soos reeds genoem, blyk die tendens te wees dat die ouer dames ’n gesonder leefwyse handhaaf (LSBB) as die jonger groep ongeag of hulle fisiek aktief is al dan nie. Wat die psigososiale welstand betref is die tendens net omgekeerd en blyk die jonger groep dames weer beter te vaar as wat die geval is met die ouer groep (postmenopousaal) (Tabel 2).

Die PSW word ewe-eens deur deelname aan fisieke aktiwiteit beïnvloed, dog die religieuse welstand blyk nie hierdeur geraak te word nie. Die rede hiervoor is nie duidelik nie, dog dit kan moontlik verband hou met die voordele soos verhoogde energievlakke (Shephard, 1990:52), selfeffektiwiteit (Poag & McAuley, 1992:358) en veranderde lewensuitkyk (bedreiging teenoor uitdaging) wat verkry word uit deelname aan fisieke aktiwiteit (Bouchard *et al.*, 1990:18).

Samevattend kan gesê word dat fisieke aktiwiteit en lewenstyl statisties betekenisvolle verbande tussen pre- en postmenopousale dames vertoon en dat fisieke aktiwiteit 'n belangrike bydrae tot geestelike en psigososiale welstand by dames kan lewer. Dit blyk ook dat die postmenopousale dame minder aktief is as die premenopousale dame. Verder blyk dit dat daar geen betekenisvolle verskille bestaan ten opsigte van beide groepe se geestelike welstand nie. Bogenoemde bevestig vorige navorsing ten opsigte van die feit dat dames andersoortig is, ook in belewenis en uitvoering van bepaalde welstandskomponente.

SUMMARY

The relation of physical activity with lifestyle and spiritual well-being in South African women

Physical inactivity is probably the single largest risk factor in the development of chronic lifestyle disorders. It has been well documented in research literature that participation in regular physical activity does have positive effects and consequences on general health and quality of life. When the physical activity status as variable in the different life habits, as described by Belloc and Breslow are taken into account, it is clear that those people who live "unhealthily" but are physically active, have a better health status even than those living healthily, but are physically inactive. The concept of spiritual well-being should, however, not only be seen as religiosity, it also contains a psychosocial dimension. The quality of the relationship of a person to his Creator (religious) as well as to his fellow man (social) is reflected in the spiritual well-being.

The aim of this research is therefore to determine the relationship of physical activity on lifestyle and spiritual well-being. The physical activity profile and to a certain extent also the spiritual well-being of men is well documented in research. The same could however not be said about women. This study therefore aimed to study some part of the South African women population. Four hundred and twenty five (425) Caucasian women between the ages of 30-65 (42.9±9.5 years) living within the municipal boundaries of the city of Potchefstroom were randomly selected to participate in this study. Participants were classified into a pre-menopausal ($\leq$49) and post-menopausal group ($\geq$50). Physical activity was measured with the physical activity participation index (PAI) of Sharkey (1984). The lifestyle index of the participants were determined according to the 7 healthy lifestyle habits, as described by Breslow and Belloc (1972). The health style questionnaire of Walker *et al*. (1987) (LSW) was also used. Spiritual well-being was determined by the questionnaire of Ellison (1983:340).

The STATISTICA computer package for Windows at the Potchefstroom University for Christian Higher Education (PU for CHE) was used for statistical processing. One-way analysis and two-way analysis of variance were used. After the statistically significance has been determined, the Newman-Keuls post hoc test was used to determine whether certain groups differ significantly from each other. Effect sizes (ES) were obtained to determine the meaningfulness of the results. For ES $\geq$0.8 the differences are regarded to be of large practical importance, while ES of more or less than 0.5 must be regard as moderate and an ES less than 0.2 is of small practical significance. The forward step-by-step multiple regression analysis was used to determine the components of lifestyle's contribution to spiritual well-being.

It seems from the descriptive data that the majority (49%) of the respondents were physical

inactive and the younger group (≤49) tended to be more physically active than the older group (≥50). The post-menopausal women tend to follow healthier lifestyle than the pre-menopausal women do. This tendency to become more physical inactive with increasing age however is international phenomena and already reported for men and women. A highly practical significant (ES≥0.8) difference existed between high active - and inactive pre- and post-menopausal women in terms of their lifestyle index (LSBB, LSW). Spiritual well-being showed a statistically significant (p≤0.05) relationship with physical activity. Statistically significant (p≤0.05) difference also existed between the physical activity index (FAI) of pre- and post-menopausal women, as far as lifestyle (LSBB & LSW) and existential well-being (EW) is concerned.

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