

Socio-Psychological Rivulets of Sport Injury Rehabilitation: The Case of Tertiary League Handball Players in Teachers Colleges of Zimbabwe.

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ABSTRACT

Sport brings enjoyment but injury presence considerably is a great source of pain, despair and stresses in athletes the world over. This study looked at socio-psychological rivulets of sports injury in Zimbabwean Tertiary Handball between 2018 and 2019. It ascertained the extent to which psychological variables impaired recuperating player's rehabilitation routes and their rehabilitation time-frames of return-to-active sport following an injury. The study was a descriptive, prospective cohort design anchored on quantitative approach. The 228 study participants comprised team physiotherapists, psychologists, fitness trainers, coaches and players from selected Zimbabwe Teachers Colleges Sports Association handball teams. Stratified random sampling was adopted in selecting respondents for the study. Questionnaires were used as data collection tools. IBM SPSS Version 23 was used for data presentation and analysis. Emerging findings revealed high deficiencies regarding players' psychological and physiological treatment among most sports medicine professionals. Subsequently a multiplicity of injuries with transitional return-to-sport variations evoked players' psychological distresses ($p=0.086>0.05$) and psychological instincts of kinesiophobia ($p=0.044<0.05$; 70.8 mean; 830.8 variance), depressive moods (66.5 mean; 730.8 variance), frustration and stress ($p=0.034<0.05$; 2.0 and 2.0). Players' rehabilitation routes ended pre-maturely leading to re-surfacing of index injuries (66.9 mean; 782.4 variance) that emanated from a 'culture of pain-risk-paradox'. Sufficient recovery and injury monitoring by sports medicine professionals during potential latent period of injury risk are essential for player's full resurgence of psychological, emotional and physiological parameters. Periodic psychological counselling services are critical in bringing sanity to players' fractured tenets from injury onset through to return-to-sport.

Key Words: rehabilitation route, return-to-sport, sport injury, psychology, handball.

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1. INTRODUCTION

Most athletes enter into sports participation for health and personal reasons (Stenner, Buckley & Mosewich, 2020). The need for personal identity, group affiliation (team cohesion), self-esteem and achievement desires (Moradi, Bahrami & Dana, 2020; Howie, Daniels, & Guagliano, 2018) constitute part of the crux for sport engagements in most sporting populations. Although the issue of success could mostly be viewed as a pre-occupying pinnacle in athletic

engagements (Moradi et al., 2020), little attention regarding the perils of physical and psychological risks seem not to receive acute considerations yet these conditions could become potential conduits to multiple psycho-physiological and socio-emotional dysfunctions (May, Driscoll, Nguyen & Ferkel, 2021). As Appaneal and Habif (2013) observes, injuries are emotionally-laden incidents that persistently bedevils recuperating athletes' psychological instincts. Notwithstanding the pain severity the athlete undergoes (Sermer et al., 2022;

Giacomo et al., 2022), transitional variations on return-to-active participation for players (Kvist & Silbernagel, 2022), ostensibly, is a critical phase that momentarily ignites psychological torture on the injured athlete (Tamminen & Watson, 2022). Equally, this triggers multiple stressor-elements of regret, anxiety, boredom, frustration, depression, self-blame and anger (Appaneal & Habif, 2013). Subsequent to drags into contexts of this nature, recuperating athletes need to be insulated from these devastating environments both physiologically and psychologically through proper rehabilitation means to plug this gap. Hence, it is within this sense that this article intends to ascertain the extent to which psychological variables potentially impaired players' rehabilitation and return-to-sport routes following injury sustenance.

Sport injury rehabilitation is nested in ancient Greek philosophy. Caring of the human body and soul needed precise knowledge on the co-existence between physical and mental resources (Mares, 2019; Ren, Gui Chen & Chen, 2019). Similarly, the essence of mental and tissue restoration were health configuration aspects that were highly esteemed by doctors (Pisk, 2017) and still remain prominent contemporary research issues, globally. Although enjoyment is an immediate gain of sport participation, more often athletes continue to operate in cultures of 'risk-pain-paradox' in spite of having acute health challenges. In this sense, psychological skills (resources) provide significant potentiating roles for players' motor and emotional behaviours in response to environmental cues (Messaoudene & Bentoumi, 2021). However, injury onset can upset this well-defined continuum eventually triggering multiple psychopathological panic modes in players. Thus far, full re-enactment of players' psychological and emotional instincts is essential for ascertaining overall fitness prior to return-to-sport contexts. Certainly, paying little attention to reminiscent human facets of this nature could fatally compromise player performance. Safe participatory environments are purely life-long asserts

in athletes career aspirations yet the rehabilitation-return-to-sport phase could present volatile environments regarding sporting uncertainties, medical consequences and developing pre-injury confidence despite having been fully ascertained to re-enter active sport participation.

The traumas and burden of sport injury often trigger emotional and psychological responses to athletes' well-being in a multiplicity of pathways (von Rosen & Heijne, 2019). Biomarkers of high stress levels, frustration, depression, anger, daily living consequences of sleep disturbances, study issues, loneliness and self-blame (Tamminen & Watson, 2022; von Rosen et al., 2018 b) have potential functional impairments (Goutteborge & Kerkhoff, 2020) on the athlete. For instance, Kristiansen and Stensrud's (2017) study reported multiple stressors from increased training and sleep reduction volumes which led to development of severe injuries in young injured female handball players. Furthermore, von Rosen and Heijne's (2019) study findings even substantiated correlations that exist between player's well-being and injury sustenance. These profound negative impacts can compromise players' physiological health instincts (Yang et al., 2014) with ruinous effects that preclude them from pursuing self-defined activities (Edouard et al., 2010). This precipitates heightened stress rates associated with decreased life satisfaction (Malinauskas, 2010).

Skill proficiency level and injury severity significantly influences an athlete's states of frustration, confusion, irritability, anxiety and loneliness. Subsequently, this inferiority complex isolates the athlete from the teammates, causing depressive moods (Toredal & Asif, 2020). Debilitating effects on athletes' academic and social dimensions have been reported (Shortway, 2017). More often such dysfunctional losses become the launch pad from which a myriad of psychologically-oriented consequences with catastrophic effects (Brooks et al., 2020) have been founded. Ideally, these have been anchored upon

anger, depression, anxiety, kinesiophobia, lack of self-confidence, frustration, feelings of loss and low self-esteem (Hsu et al., 2017; Clement et al., 2015) and have often been linked with sport injury risk (Yang et al., 2014); compliance to rehabilitation regimes (Tyler et al., 2017) and post-injury outcomes. Situations of this nature have called for social support to reduce the adverse effects of injury (Kohnehsari, 2014). On this basis psychological responses need to be addressed within the rehabilitation context if athletes are to revert to their comfort zones of sports participation.

In a multi-sport study conducted by Mapfumo and Muchena (2014), among 183 under 20 high school athletes during the 13th Zimbabwe National Youth Games Edition in Mutare (handball included), injury and illness emerged as major psychological sources of worry. More girls (60%) than boys (44%) were worried about being injured. On the contrary, fewer girls (18%) were worried about competition pressure than boys (23%) but taken together, results reflect the catastrophic impact of injury in sport circles. Comparative studies have also reported heightened depressive moods and anxieties among injured than uninjured group of athletes (Covassin et al., 2015). This serialised psychological sequelae to injury, impact heavily on athletes' healing cycles and return-to-sport outcomes (Arden et al., 2016). Undeniably, psychological and physiological traumas could potentially impair the athlete's performance with high levels of injury risk (Podlog et al., 2014). Naturally, injured athletes are exposed to feelings of loneliness and isolation emanating from their incapacities to train and compete alongside their teammates which can, resultantly, disrupt their athletic identity (Lippi et al., 2020; Pabian et al., 2017).

Literature search substantiate multiple psychological triggers of re-injury anxieties (Fuller et al., 2017; Vardeh et al., 2016), inability to regain pre-injury standards (Di Stasi et al., 2015), feelings of isolation (Bejar et al., 2017; Arden et al., 2015), lack of athletic identity and social support

(Shortway et al., 2017) on athletes on the verge of return-to-sport. Further, personal concerns regarding an athlete's physiological deficits and incompetence significantly determine the quality and nature of athletes' return to their pre-injury states (Hsu et al., 2017; Clement et al., 2015). Thus psychological distress could be fertile ground for risk dynamics (Fuller et al., 2017) regarding athletes' post-injury revitalisation.

Generally, return-to-sport athletes are susceptible to re-injury concerns (Caitlin et al., 2018) and heightened kinesiophobia (Bejar et al., 2017) despite having been ascertained to return-to-active participation. Kinesiophobia can prejudice bodily physiological functions, especially muscle endurance leading to altered muscle recruitment with increased chances of re-injury on the athlete (Kyritsis & Witvrouw, 2014). Stress and fear of re-injury during participation may cause reduced concentration, subsequently delaying the recovery process, hence a major contribution of re-injury in handball (Hagglund et al., 2018). For instance, reduction of knee dynamic stability and restricted Range of Motion following rehabilitation (Tjong et al., 2015) especially the neuropathological and osteo-articulation systems of the body from prolonged idleness. This further amplifies the athlete's level of perceived severity and susceptibility (Caitlin et al., 2018) and re-triggers the lived experiences on treated index injuries and the pending nature of the aggressive impact of handball. Such heightened kinesiophobia and stress rates are indicators of player's amplified psychological reservations to re-enter into the crunch nature of competitive contexts.

Researchers show that re-injury anxieties may exhibit retrogressive impact on athletes' post-injury performances. Hart et al.'s (2015) cross-sectional study of 66 athletes suffering from ACL reconstruction (30) and knee osteoarthritis (36) revealed that those with knee osteoarthritis had significantly worse knee confidence ($p = 0.010$). They showed greater

kinesiophobia ($p = 0.006$) than those without osteoarthritis. The study reported 58% for the non-osteoarthritis exhibiting no trouble with knee confidence, 33% had mild-moderate trouble and 8% exhibiting severe problems. The osteoarthritis group (27%) reported no problems with knee confidence, 40% had mild-moderate trouble, with the 33% having severe-extreme trouble. Thus, athletes might not attain full restoration of joint injuries due to functional impairments of muscles and ligaments. This may, as a result, lead to development of kinesiophobia to returning athletes even if they have been cleared to return-to-active cycle of participation by sports medicine professionals. However, Hart et al.'s (2015) study was confined to young children, unlike this research whose sample was drawn from tertiary students who are above 18 years of age. The likelihood of developing kinesiophobia at such a tender age is inevitable and the student might not realise the magnitude of commitment in sport, an attribute the older athletes might have. Such physiological dysfunction may trigger psychological and neuromuscular impairments, resulting in non-return to active sport by athletes.

In another related case control study of 25 patients with Chronic Ankle Instability to determine global, regional and psychological health-related outcomes, Mesa and Norfolk (2014), announced reduced muscular function and increased kinesiophobia than among the healthy participants. Of the sample, the CHI group reported 60% bilateral and 16% unilateral ranges and ankle history. Further claims have been put forth demonstrating that 74% of ankle sprain athletes may develop residual signs, with likelihood of persistence for a substantial number of years following index injury, eventually leading to chronic ankle instability (Braun, 1999). This leads to severe mechanical malfunctions with long-term physiological restrictions subsequently eliciting health-related life complications. This could possibly damage athletes' socio-psychological resources, with implicated traits of fear avoidance beliefs and kinesiophobia to re-enter into sport participation.

Uncertainties to regain pre-injury intensities and achieve potential aspirations constitute part of the basis of nervousness among high performance athletes (Bejar et al., 2017; Hsu et al., 2017). This stress source is believed to emanate from players' prolonged musculoskeletal synergy lay-offs (Di Stasi, et al., 2015), and improvements made by teammates during one's absence from competitive contests (Taylor et al., 2017). Despite this, mechanical loading deficits during one's performance (Caitlin et al. 2018; Arden et al., 2017; Hsu et al., 2017) also contribute to athletes' doubts of capabilities due to injury. Concerns of this nature might not be a surprise, given the athletes' desire to reach their physiological capabilities and performance at the highest level of competition. What remains unclear is how long concerns about performing to pre-injury levels persist following the return to full activity.

In another parallel study involving 114 male and female senior and young handball players from a Spanish regional league, 101 injuries were reported. Players missed practice for 3 weeks and an average of 5 Physical Education lessons due to injuries throughout the season (Lastra et al., 2021). This could not withstand triggering of elevated kinesiophobia rates on players' academic side. This 'Fear Of Missing Out' (worry of missing opportunities, rewards and social networks) is further substantiated in Elhai et al.'s (2020) study of 93 undergraduate Midwestern U.S. University students in which this FOMO construct was strongly linked to psychopathological-oriented variables of panic and anxiety disorders. Apparently both studies reveal physiological retardation gaps between rehabilitation and return-to-sport periods that need to be plugged. Hence self-presentational uncertainties of regaining pre-injury skill proficiency could be problematic.

Lee et al.'s (2020) cross-sectional study of 624 elite Korean National University injured Physical Education students revealed 56% sports injury prevalence.

Players treatment time frames were associated with fear of injuries and career length while willingness to pay for treatment was influenced by psychological factors of fear of further injuries by career length and injury type/location. Injury severity was rampant during the 12 month period (Handball, 51.6%; Gymnastics, 62.96%; Judo, 81.40%; Bowling, 66.67%). The level of psychological torture correlated with severity of injury although the study showed that players with short experience exhibited shorter treatment timelines than those with lengthy experiences in both genders. In a different study Messaoudene and Bentoumi (2021) found out that years of practice experience in Algerian Handball Federation teams positively correlated with heightened psychological skills and competitive behaviours in handball players. Although strong teams are founded upon quality resilient players and prevailing motivational environments, injury risks still remain high due to much exposure to competitive fora. Eventually this evokes players' psychological instincts upon perceiving the probability of getting injured. In a related study on injured players, Magadalene and Magadalene (2015) found out that 43% returned to sport in less than a month, 29% in 2 months and 14% in 3-4 months. These variations could suggest socio-psychological presentational challenges regarding injury severities and players' healing timelines. Situations of these natures are inevitable in sport injury circles as players' hope pathways to return-to-active-sport are often stained.

Parteno et al. (2010) observed prevalence of knee deficits during multi-planar movements leading to ACL re-injury. Their prospective study of 56 medically cleared high risk ACL revealed 13 re-injuries during a year's follow-up of active participation. Emerging findings indicated that neuromuscular and biomechanical factors (transverse plane, hip movements, frontal plane knee angles, sagittal plane knee moments, deficits in postural stability) invoked re-injury, with 92% sensitivity and 88% specificity. Di Stasi et al. (2015) and Arden et al. (2014) similarly found

neuromuscular incapacities and functional impairments to be highly associated with re-injury of ACL for athletes resuming sports following injury rehabilitation.

In an earlier cohort study of 552 athletes who underwent primary reconstruction and revision reconstruction, Lefevre et al. (2017) found no significant differences in sport-return between men (90.9%) and women (87.3%) after a one (1)-year follow-up. In a comparable study conducted by Grossi et al. (2015), for revision surgery during a 5.3 year follow-up, the authors reported a 53% return, with Rodriguez-Roiz et al. (2015) announcing a 91.9% return for recreational sport and 51.2% at the same level. In Arden et al.'s (2014) cross-sectional study to re-enact 164 ACL athletes during a 1-7 year follow-up, results showed that 40% reported positive knee functions. However, 28% could not return-to-sport, citing suspicion on knee recovery and function, 22% had poor knee function, and 24% feared re-injury. It is in this sense that Arden et al. (2014) underscored the significance of considering the impact of appraisals of knee function following return to pre-injury conditions. These results portray variations that may arise in recovery rates following injury sustenance, depending on injury severity. They tend to reinforce the association that exists between rehabilitation and return-to-sport transition, a critical point which, when not seriously observed, might see athletes failing to fully re-claim their physiological and psychological resources. Lastly, when confronted with such circumstances, could be tempted to resort to protective behaviours by avoiding sports competitions, fearing injury re-ignition resulting from high knee loading, knowing very well about their knee incapability.

Given this background this study explored how socio-psychological aftermaths of sports injury could compromise athletes' self-authored decision-making processes from injury onset, rehabilitation through to return-to-sport phases. The following hypotheses were forthwith formulated:

1.2 Hypothesis

1. There are no major associations between missed training days and player's psychological instincts.
2. There is an association between missed training days due to injury and major transitional variations between athletes' recovery time lines.

1.3 Theoretical framework

This study was grounded within the frameworks of The Sports Commitment Theory (SCT) (Scanlan et al., 2017). The model explicates that injured athletes derive their hope and commitment pathways of recovery from 8 critical sources of sport enjoyment, personal investment, valuable support, social constraints, social support, enthusiastic commitment and constrained commitment which underpin their adherence to rehabilitation for early come back to sport (Kellmann et al., 2018; Majewski, 2018). It was adopted for its restorative potency in making recuperating athletes arrive at self-authored approaches to emotionally and practically re-engage themselves in prescribed rehabilitative regimens (Shen et al., 2019).

2. METHODOLOGY

The study was a descriptive, prospective cohort design hinged on the quantitative approach. The study population was 453 from which a sample of 228 participants comprising team technical staff of coaches, physiotherapists, psychologists, fitness trainers and players were drawn. Participants were from 10 selected Teachers Colleges in Zimbabwe. Male and female handball players were from

original teams for the entire period of study. Selected participants had specific roles in their team functions. Stratified random sampling was used to draw a systematic sample from each group. Taro Yamani's (1970) formula then determined a manageable sample size of 228 while Bowley's proportional allocation formula statistically distributed respondents into their respective strata. Questionnaires were adopted as tools for collecting the time data. Cronbach alpha statistics was used to determine the internal consistency of the questionnaire items before the instrument was used in the field. The test yielded the Cronbach's Alpha of 0.8 acceptable level of consistency. The instrument was pre-tried using a lesser linked sample prior to its utilisation in the field (Maheshurani, 2017). Collected data for the study was quantitatively analysed using IBM SPSS Statistics Version 23 and presented on frequency tables, pie chart and logistic regression models. Hypothesis testing was performed using Fisher's Exact Test and Chi Square Statistic.

A clearance letter was sought from the Ministry of Higher and Tertiary Education, Science and Technology Development and Teachers' College authorities. Informed consent was sought from study participants drawn from the selected institutions. Anonymity and Confidentiality of data were established to meet ethical standards.

3. RESULTS AND DISCUSSION

According to allotment of results in Table 1, the psychological variables have been split into four categories, namely, physiological, psychological, emotional and social. Analysis of the mean and median scores reveals that most variables had a moderate impact score of 2.0 on players. Nevertheless,

Table 1: Impact of psychological variables on players' following sports injuries

Psychological variable	Mean	Median
Physiological impact		
Muscle incapacities and retarded performance rates from injured players	2.3	2.0
Presence of re-injuries among players	2.4	2.0
Lengthy physical recovery challenges	2.2	2.0
Prolonged pain intensities	2.2	2.0
Psychological impact		
High rates of stress levels due to injury presence	2.0	2.0
High rates of fear of re-injuries among injured athletes	2.4	2.5
Presence of psychological distress among injured athletes	2.3	2.0
Presence of disruption of life patterns among injured athletes	2.2	2.0
Emotional impact		
Presence of low self-esteem among injured athletes	2.0	2.0
Lack of self confidence among injured athletes	2.2	2.0
Levels of anxiety among injured athletes	2.6	3.0
Presence of depressive moods among injured athletes	2.3	2.0
Cases of isolation of injured athletes from non-injured	1.7	2.0
Social impact		
Presence of non-compliance to rehabilitation regimes among injured athletes	2.0	2.0
Presence of loss of identity among injured athletes	1.7	2.0
Pre-mature entry into active participation before fully serving rehabilitation route by injured athletes	2.3	2.0
Player adjustment problems to team homogeneity	2.1	2.0

injured athletes exhibited high rates of fear of re-injuries (mean, 2.4; median, 2.5), psychological distress (2.3 and 2.0) and life patterns disruptions (2.2 and 2.0). In the same vein, players indicated elevated anxieties (2.6 and 3.0), depressive moods 2.3 and 2.0) and low self-esteem (2.2 and 2.0). Results also show presence of re-injuries (2.4 and 2.0), muscle incapacities and retarded performance rates (2.3 and 2.0) with presence of pain intensities and lengthy recovery cases scoring 2.2 and 2.0, respectively. A few isolated cases were from the non-injured group (1.7 and 2.0). Regarding social impact, high rates of pre-mature entry into sport cases (2.3; 2.0), non-compliance to rehabilitation regimes (2.0; 2.0) and adjustment problems to team homogeneity emerged

(2.1 2.0) while, loss of identity (1.7; 2.0) presented less effect on the players. Similar impacts were noted on the stress levels and low self esteem dimensions alike (2.0; 2.0).

Injury presence as a psychological source of worry reported in this study, resembles similar findings reported in Mapfumo and Muchena' s (2014) multi-sport study for the under 20 Zimbabwe National Youth Games, 13th Edition in Mutare. They announced 60% injury worry among girls with the figure for boys reportedly to be standing at 44%.

The general tendency of results depicts players' high affinity levels of participation in the games, despite multiple challenges

they faced. The different variables significantly affected players' recovery routes, which are much aligned to study results by Arden et al. (2016), whose study reported multiple injuries among handball players. Pertaining to physiological impact of injuries reported in this study, advancements of this nature have also been replicated in similar studies from Lefevre et al. (2017), Di Stasi et al. (2015), and Grossi et al. (2015). Basing on high rates of psychological impact of injury reported in this study (depression, anxiety, lack of self confidence, frustration, loss of identity, low self esteem, kinesiophobia), findings of a similar nature have also been announced by a number of authors. For instance, retrogressive impact of kinesiophobia has been shared in previous studies by Bejar et al. (2017), Hsu et al. (2017) and Clement et al. (2015). Depressive moods and pain intensity have been reported by Stephanie and Connor (2014), among 26 of 44 post-surgery injured athletes. Similar tendencies have also been shared in reviewed studies to authenticate current study results (Fuller et al., 2017; Covassin et al., 2015). On the contrary, low rates of fear of pain, re-injury and underperformance reported in the present study compares well with Podlog et al.'s (2015) study. The net effect of psychological and physiological impact of injury could have immensely contributed to elevated injury risk, surfacing and re-ignition of treated injury cases reported in this study. This confirms findings from Podlog et al.'s (2014) study, in which kinesiophobia was found to impair players' performance and eventually a high predictor of injury risk in sport pursuits.

This study reported disruption of life patterns and uncertainties for the injured athletes indicating the ruinous effects and cost implications connected with sport injury on the part of the player, regardless of the enjoyment that it brings to them. Results are, thus, consistent with findings reported in studies conducted by Bejar et al. (2017) in which injury emerged a confounding variable on players' normal life patterns.

Pertaining to emotional impact, this study reported depressive moods among the injured players. This relates well with reports from studies conducted by Shortway et al. (2017) and Fuller et al. (2017). Similar claims were noted from Clement et al.'s (2013) study, in which depressive moods and anxiety levels among injured athletes stood at 3.25% and 4.24%, respectively. Though to a lesser extent as reported in this study, the effects of loss of athletic identity among recuperating players has also been announced in Lockhart's (2010) study, as well as isolation cases as noted in Covassin et al. s' (2015) study.

The issue of pre-mature entry into active sport by players prior to fully serving rehabilitation routes is indicative of players' commitment to sports albeit multi-personal benefits and the inherent drive. Cases of pre-mature ending of rehabilitation routes to enter into active sport participation, as presented in this study, have also been confirmed in Kyritsis et al.'s (2016) study. More so, a close connection of the current study results can be noted with Nixon's (2007) theory, and Scanlan et al. (2016), who indicated that committed players are inclined to continue playing in 'a culture of pain' even if they are not fully fit. Hence, such players are most likely to exhibit less compliance to prescribed rehabilitation regimens if they feel engaged in lengthy recovery cycles. Such players are likely to succumb to pressure to return-to-sport from coaches, team mates, friends and family, in order to protect their personal identities and team homogeneity. Subsequently, this validates the resonance of Scanlan et al.'s (2016) model and Nixon's (2007) theories in contemporary health and sport injury rehabilitation research, as supported in the current study.

The general impression that can be drawn from these results is that the presence of sports injury significantly impacted on players' socio-psychological, physiological and emotional instincts. Accordingly, a visible correlation is noticeable in findings from previous studies by Hsu et al. (2017),

and Vardeh et al. (2016) whose concurrence revealed a strong association of the aforementioned resources on sport injury risk. The implication is, therefore, on the injury burden health service providers

are entrenched in to fully resolve injured players' socio-psychological and emotional integrities for safe return-to-sport.

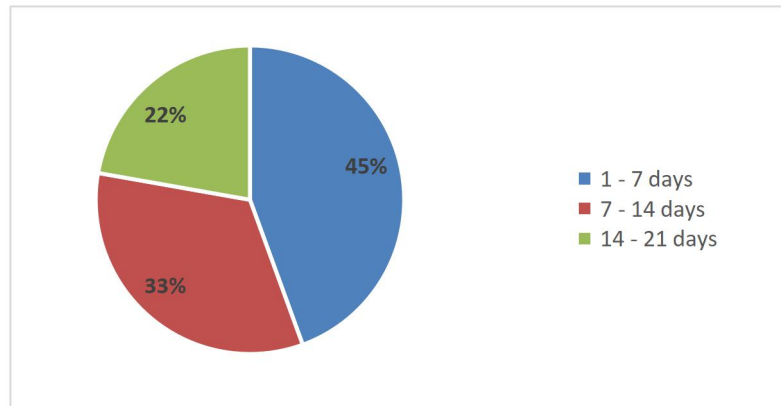


Figure 1: Number of training days missed due to injury

Regarding absence from training workouts, in order of regularity most players missed between one (1) and seven (7) days (45%) due to injury, then 7 – 14 days (33%) and finally, 14-21 days (22%). Thus, results show high opportunity cost (time loss injuries) from days lost to injury among players during rehabilitation. Thus, trigger of psychological worries with varied recovery timelines in relation to injury severity is inevitable. Subsequently, well-rounded skill-sets of sports clinicians are critical in bridging the rehabilitation-return-to-play gap. Transitional variations of a similar nature regarding players' recovery time lines and return-to-sport rates have also been accounted by Magdalene et al. (2015), in which 43% of players returned to sport in less than a month, 29% in two months, and 14% in 3-4 months. Similarly Lastra et al (2021) reported Spanish handball players missing an average of a week's training sessions and 5 PE lessons from injury sustenance. Besides disruption of life patterns, retrogressive effects on performance rates and long term health challenges placed on the players' health and psychological instincts is evident. This synchronises well with findings from

parallel works in this field reported in studies conducted by Hsu et al. (2017), Vardeh et al. (2016) and Clement (2015) who advance the argument that sports injury aftermaths can dent athletes' socio-psychological and physiological instincts.

Fisher's Exact Test and Chi Square (Table 2) were used to ascertain whether there was an association between number of missed training days due to injury (divided into two groups: 1-7 days and >7 days) and psychological variables: high stress levels due to injury presence, high rates of fear of re-injuries, presence of psychological distress and disruption of life patterns among injured athletes. Results explicate that there is a significant association between number of missed training days due to injury and high stress due to injury presence ($p = 0.034 < 0.05$). H_0 is therefore rejected and H_1 accepted. Similarly, significant associations between missed training days and fear of re-injuries ($p = 0.018 < 0.05$), as well as disruption of life patterns and heightened kinesiphobia ($p = 0.044 < 0.05$), were noted. In both cases, H_0 is rejected and H_1 accepted. No significant association between missed training days and psychological distress

was noted ($p = 0.867 > 0.05$), implying rejection of H_1 and acceptance of H_0 .

Table 2: Tests of association between missed training days and psychological impact variables

Hypotheses	Df	P-value	
		Chi-square	Fisher's Exact Test
Ho: There is no association between Number of missed training days due to injury and high stress rates due to injury presence H1: There is an association between Number of missed training days due to injury and high stress rates due to injury presence	1	0.034	0.069
Ho: There is no association between Number of missed training days due to injury and high rates of fear of re-injuries among injured athletes H1: There is an association between Number of missed training days due to injury and high rates of fear of re-injuries among injured athletes	1	0.018	0.477
Ho: There is no association between Number of missed training days due to injury and presence of psychological distress among injured athletes H1: There is an association between Number of missed training days due to injury and presence of psychological distress among injured athletes	1	0.867	1.000
Ho: There is no association between Number of missed training days due to injury and presence of disruption of life patterns among injured athletes H1: There is an association between Number of missed training days due to injury and presence of disruption of life patterns among injured athletes	1	0.044	0.183

As shown in Table 3, player's re-injury anxiety inventories on the levels of kinesiophobia based on their return-to-sport rating scale revealed that most players presented less worry about being injured (68.4 mean; 981.9 variance) or re-injured (65.5 mean; 730.8 variance) during rehabilitation. The majority of respondents expressed heightened levels of confidence of re-claiming their pre-injury skills (80.5), giving their maximum effort (87.1), and

being less nervous about returning to sport after injury (86.8). However, they expressed less confidence in playing with pain (64.9), or feared re-triggering of index injuries (66.9; 67.8) upon their clearance to-return-to competitive handball contexts. More importantly, re-injury anxieties among recuperating players are evident, as shown by a mean of 68.4 and 65.4, respectively

Table 3: Re-injury Inventory on levels of kinesiophobia upon return-to-sport rating scale

Attribute	Level of kinesiophobia		
	Mean	Median	Variance
Re-injury anxiety inventory			
I am worried about being injured during rehabilitation	68.4	80	981.9
I feel nervous about becoming re-injured during rehabilitation	65.5	70	730.8
Return-to-sport rating scale			
Are you confident you can give 100% effort during your participation in the game?	87.1	90	279.7
Are you confident to re-claim your pre-injury skill proficiency?	80.5	90	379.2
What is your overall confidence to play in the game of handball?	86.8	90	314.1
I am worried about re-injury on re-entry into competitive handball	70.8	80	830.8
Are you confident you can play your sport without concern for your injury (ies)?	75.0	80	533.1
Are you confident the recovering site can handle the game demands of handball?	77.0	80	486
Are you fearful of re-injury by participating in your sport?	66.9	70	782.4
Do you find it frustrating considering your injury (ies) with respect to your sport?	66.9	70	778.5
I feel nervous about re-injury on re-entry into competitive handball	67.8	70	850.8
How confident are you to play with pain in handball?	64.9	60	582.1

Study results are within the precincts of the Sports Commitment Theory (SCT), that values 8 sources from which injured athletes' hope and sports commitment pathways are derived, that is, sport enjoyment, personal investment, valuable opportunities, social constraints, social support, enthusiastic commitment, constrained commitment decision and other priorities. This supports its wider popularity in use in contemporary health and sports injury epidemiological research field (Kellmann et al., 2018; Majewski, 2018; Scanlan et al., 2016).

As indicated in Table 4 if we hold all the other variables constant, a unit decrease in the level of nervousness about

becoming re-injured during rehabilitation decreases the odds of a more severe injury by 4.5%. In the same vein, a unit decrease in the level of fear of re-injury by participating in sport increases the odds of a more severe injury by 2.7%. On the other hand, a unit decrease in nervousness about re-injury on re-entry into competitive handball increases the odds of a more severe injury by 2.7%. Similarly, an increase in confidence of reclaiming pre-injury proficiency increases the odds of a more severe injury by 3.7%. Finally, less frustration with injuries is associated with increases in the odds of a more severe injury by 3.9%.

Table 4 below presents Logistic regression model coefficients for variables related to injury severity:

Table 4: Logistic regression model coefficients

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 7^a	I feel nervous about becoming re-injured during rehabilitation	-.046	.014	10.446	1	.001	.955
	I feel nervous about re-injury on re-entry into competitive handball	.026	.013	4.062	1	.044	1.027
	Are you confident to re-claim your pre-injury skill proficiency?	.036	.015	5.860	1	.015	1.037
	Are you fearful of re-injury by participating in your sport?	-.029	.012	5.406	1	.020	.972
	Do you find it frustrating considering your injury (ies) with respect to your sport?	.038	.013	8.975	1	.003	1.039
	Constant	-.484	1.080	.201	1	.654	.616

3.1 Hypothesis testing

Basing on Table 4 results, nervousness strongly correlates with re-injury anxiety during rehabilitation ($p = 0.001 < 0.05$). H_0 is, therefore, rejected and H_1 accepted which states that: There is an association between missed training days due to injury and major transitional variations between athletes' recovery time lines. In addition, a strong correlation exists between the nervousness construct and re-injury worries on re-entry into handball competitive contexts ($p = 0.044 < 0.05$).) Also, a recount of the severities of sustained treated index injuries strongly correlates with psychological re-ignition of the aftermath experiences of rehabilitation with respect to the nature and aggressiveness of game contexts ($p = 0.003 < 0.05$). H_0 in both cases is, therefore, rejected and H_1 accepted which states that: There is an association between missed training days and due to injury and re-injury anxieties among return-to-sport athletes upon their clearance. Similarly, the construct of kinesiophobia (fear) is strongly linked with re-injury worries when participating in sport ($p = 0.020 < 0.05$). Thus, less fear or confidence correlates with chances of sustaining more severe injuries due to inherent commitment and intrinsic drive in

spite of athlete's poor physiological, psychological and emotional well being while on the other hand this could encourage adherence behaviours to rehabilitation protocols. Equally, heightened kinesiophobia levels are indicators of amplified reservations to re-enter into competitive handball contexts. Hence H_0 is rejected and H_1 accepted which states that: There is an association between missed training days due to injury and high stress rates due to injury presence. Lastly, regression results indicate a strong correlation between confidence to reclaim pre-injury skill proficiency and rehabilitation treatment regimes ($p = 0.015 < 0.05$). Consequently, H_0 is, therefore, rejected and H_1 accepted which states that: There is an association between missed training days due to injury and players' adherence rates to prescribed rehabilitation routes.

4. Conclusions

Study findings revealed high psychological modes of kinesiophobia, stress, depressive moods and anxiety among athletes who missed training during rehabilitations. Subsequently, players' rehabilitation routes ended pre-maturely leading to re-surfacing of index injuries and new cases as players were subjected to a 'culture of pain-risk-paradox'.

5. RECOMMENDATIONS

Sufficient recovery and injury monitoring by sports medicine professionals during potential latent period of injury risk are essential for player's full resurgence of psychological, emotional and physiological parameters. Periodic psychological counselling services are critical in bringing sanity to players' fractured tenets from injury onset through to return-to-sport.

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