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The Relationship of Coping with Motor ability, Set Shifting ability, Visuo constructive and Visual Memory among Males with HIV/AIDS in Manipur

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ABSTRACT

The present study attempts to examine the relationship of neuropsychological function and coping strategies used by males with HIV/AIDS in Manipur. Study had been done on 100 males who were HIV/AIDS positive and who were within age range of 20 to 50 years using NIMHANS Neuropsychological Battery and Coping Check List. The present study reveals that there is no relationship of coping strategies with motor ability, set shifting ability, spatial relations and visual memory in males with HIV/AIDS.

Keywords: motor ability, set-shifting, spatial relations, visual memory, coping

INTRODUCTION

HIV-associated dementia (HAD) is the most severe form of HIV-associated neurocognitive disorders (HAND), which typically occurred in severely and prolonged immunosuppressed patients when antiretrovirals were not available. Onset is insidious and the clinical syndrome results from subcortical dementia (Becker et al., 1995). The main symptoms include neurocognitive impairment such as decreases in psychomotor speed, attention and concentration, memory and learning information processing or executive (Dawes et al., 2009). There may also be motor slowing, lack of coordination or tremor that may progress to disabling weakness, spasticity, extrapyramidal movement disorders and paraparesis (Navia et al., 1986). In addition there may be behavioural affects such as apathy and irritability. The earliest psychological impact of being diagnosed with HIV can be understood within the framework of Kübler-Ross cycle of grief involving denial, anger, bargaining, depression and acceptance. However, the most important additional aspect in HIV/AIDS is the social stigma. Soon after becoming aware of one's seropositive status, the HIV infected patient often has to work through life changes including relationships, family, employment, finances etc. Disclosure of seropositivity can be a stressful decision. If the individual feels the need to disclose and the outcome of disclosure is positive, this can be associated with better quality of life (Chandra et al., 2003). Quality of life in the early asymptomatic stage of illness is usually better than early symptomatic or AIDS stage with impact on both physical and psychological domains. Quality of life can be influenced by educational status and income as well (Wig et al., 2006). When symptomatic a range of factors such as physical health, employment and social and biological function can impact upon quality of life (Kohli et al., 2005). Tarakeshwar *et al.,* (2007), studied 50 adults with HIV with regards to their beliefs that helped manage the illness and found that all 50 believed God to be a benevolent force. The spiritual practices were described as enabling them to face their troubles with less fear and greater confidence. In most low and middle-income countries only a minority of the population have access to HAART, and a significant proportion of patients end up without active treatment.

COPING:

Coping is defined as a process by which an individual manages the ever-changing environment (McFarland & McFarland, 1993). Coping is defined as the things people do to master, tolerate, and minimize life strains or demands. Coping is "a constantly changing process involving cognitive and behavioral efforts deployed to manage specific external and or internal demands that are appraised as stressful" (Lazarus & Folkman, 1991). Coping may

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be seen as actions taken by persons directed at confronting demands, solving problems, and/or altering and managing stressors (McCubbin et al., 1996).

In psychology, coping is expending conscious effort to solve personal and interpersonal problems, and seeking to master, minimize or tolerate stress or conflict (Cummings et al., 1991). The effectiveness of the coping efforts depends on the type of stress and/or conflict, the particular individual, and the circumstances. Psychological coping mechanisms are commonly termed coping strategies or coping skills. Subconscious or non conscious strategies (e.g. defense mechanisms) are generally excluded. The term coping generally refers to adaptive or constructive coping strategies, i.e. the strategies reduce stress levels. However, some coping strategies can be considered maladaptive, i.e. stress levels increase. Maladaptive coping can thus be described, in effect, as non-coping. Furthermore, the term coping generally refers to reactive coping, i.e. the coping response follows the stressor. This contrasts with proactive coping, in which a coping response aims to head off a future stressor. Coping responses are partly controlled by personality (habitual traits), but also partly by the social environment, particularly the nature of the stressful environment (Carver Charles & Connor-Smith, 2010).

People using problem-focused strategies try to deal with the cause of their problem. They do this by finding out information on the problem and learning new skills to manage the problem. Problem-focused coping targets the causes of stress in practical ways which tackles the problem or stressful situation that is causing stress, consequently directly removing/reducing the stress. It aimed at changing or eliminating the source of the stress. The three problem-focused coping strategies identified by Lazarus & Folkman (1991) are taking control, information seeking, and evaluating the pros and cons.

- Taking Control – this response involves changing the relationship between yourself and the source of stress. Examples: escaping from the stress or removing the stress.
- Information Seeking – the most rational action. This involves the individual trying to understand the situation (e.g. using the internet) and putting into place cognitive strategies to avoid it in future. Information seeking is a cognitive response to stress.

Evaluating the Pros and cons of Different Options for Dealing with the Stressor:

In general problem-focused coping is best, as it removes the stressor, so deals with the root cause of the problem, providing a long term solution.

However, it is not always best, or possible to use problem-focused strategies. For example, when someone dies, problem-focused strategies may not be very helpful for the bereaved. Dealing with the feeling of loss requires emotion-focused coping.

Problem focused approached will not work in any situation where it is beyond the individual's control to remove the source of stress. They work best when the person can control the source of stress (e.g. exams, work based stressors etc.).

It is not a productive method for all individuals. For example, not all people are able to take control of a situation. People with low self esteem typically use emotion focused coping strategies.

Emotion-focused strategies involve releasing pent-up emotions, distracting oneself, managing hostile feelings, meditating or using systematic relaxation procedures. Emotion-focused coping "is oriented toward managing the emotions that accompany the perception of stress" (Brannon & Jess, 2009). The five emotion-focused coping strategies identified by Folkman and Lazarus are disclaiming, escape-avoidance, accepting responsibility or blame, exercising self-control, and positive reappraisal. Emotion-focused coping is a mechanism to alleviate distress by minimizing, reducing, or preventing, the emotional components of a stressor. This mechanism can be applied through a variety of ways, such as seeking social

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support, reappraising the stressor in a positive light, accepting responsibility, using avoidance, exercising self-control, and distancing (Carver, 2011). The focus of this coping mechanism is to change the meaning of the stressor or transfer attention away from it. For example, reappraising tries to find a more positive meaning of the cause of the stress in order to reduce the emotional component of the stressor. Avoidance of the emotional distress will distract from the negative feelings associated with the stressor. Emotion-focused coping is well suited for stressors that seem uncontrollable (ex. a terminal illness diagnosis, or the loss of a loved one). For example, when an individual's spouse is diagnosed with a terminal illness, the healthy partner cannot change the diagnosis. In this case, the most effective way to manage the stress is for the healthy partner to change his or her perspective or appraisal of the stressor. It is more effective to effect change in the partner's emotional reaction to the diagnosis than it is to focus on changing or denying the diagnosis, although denial, too, is an emotion-focused means of coping (Laureate Education, 2012). Some mechanisms of emotion focused coping, such as distancing or avoidance, can have alleviating outcomes for a short period of time; however they can be detrimental when used over an extended period. Positive emotion-focused mechanisms, such as seeking social support, and positive re-appraisal, are associated with beneficial outcomes (Ben-Zur, 2009). Emotion-focused coping would not be effective when an individual is chronically late making their mortgage payment, although they have enough money to make the payment. In this case, changing one's emotional response to needing to make a payment in a timely manner will not help change the problem. Problem solving may be more appropriate since the stressor, (making late payments) is changeable.

Typically, people use a mixture of all three types of coping strategies, and coping skills will usually change over time. All these methods can prove useful, but some claim that those using problem-focused coping strategies will adjust better to life (Taylor, 2005). Problem-focused coping mechanisms may allow an individual greater perceived control over their problem, whereas emotion-focused coping may sometimes lead to a reduction in perceived control (maladaptive coping).

Lazarus "notes the connection between his idea of 'defensive reappraisals' or cognitive coping and Freud's concept of 'ego-defenses', coping strategies thus overlapping with a person's defense mechanisms (Robinson, 2005).

Coping Strategies of HIV Seropositive:

In a study by Jennifer *et al*., (1997), it has been found that neuropsychological impairment occurs in many persons with AIDS and in a smaller proportion of asymptomatic HIV-1 carriers, but the implications of such impairments in terms of psychosocial functioning are poorly understood. They explored potential differences in coping activity (e.g., cognitive and behavioral efforts to manage, alter, or regulate emotional responses to stressful situations) in a group of 275 medically symptomatic and asymptomatic HIV-positive men stratified on neuropsychological impairment. Regardless of medical symptom status, persons rated as being neuropsychologically impaired in attention/speed of information processing and verbal skills utilized significantly more confrontive coping than did unimpaired subjects. It may be that individuals with difficulty sustaining attention to details or reduced ability to process verbal information resort to impulsive forms of coping because they are less able to assess the precise nature or extent of threat or harm posed by a stressful situation.

Neuropsychological abilities, such as memory, can affect how someone learns, adopts, and ultimately utilizes different coping strategies (Krpan et al., 2007). Coping strategies can be conceptually categorized into two types: action-focused (also referred to as

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active, problem-focused, and positive coping strategies), which includes active coping behaviors targeted at changing the source of a stressor; and emotion-focused (also sometimes referred to as avoidant coping or negative coping), that are used to regulate emotional responses to a stressor (Folkman & Lazarus, 1980). Although emotion-focused and avoidant coping are often used interchangeably, emotion-focused coping, defined as coping aimed at lessening emotional distress, has been adopted as a parent factor to avoidant coping, which is a type of emotion-focused coping expressed by actions that purposefully avoid confronting a stressor with the goal of indirectly reducing emotional distress (Billings & Moos, 1981). Evidence supports a positive association between good neuropsychological functioning and action-focused coping skills as well as between poor neuropsychological functioning and emotion-focused coping skills.

One study found that patients with TBI who developed PTSD were more likely to have adopted an avoidant coping strategy, which positively influenced PTSD symptom severity (Bryant et al., 2000). A similar pattern was also noted by Johnsen et al., (2002), which indicated that the adoption of emotion-focused coping did not improve symptom severity over time, when compared to other coping styles. In a similar vein, PTSD mediates the impact of coping skills on quality of life (Huijts et al., 2012). These studies suggest that it is important to study coping and quality of life in veterans who are at risk for PTSD, TBI, and other neuropsychological impairments that may negatively affect redeployment from the war zone. Veterans are a patient group that frequently present with symptoms of both PTSD and TBI, which are in turn associated with neuropsychological implications that can complicate treatment (Najavits et al., 2012). Although coping skills are already taught as part of evidence-based approaches to treatment for military personnel (Rosen et al., 2004), there is a paucity of literature that examines how different cognitive deficits, such as memory and attention, affect the ability of an individual to adopt and utilize these skills, and subsequently impact on quality of life. However, recent literature supports this relationship in patients with acquired brain injury (Wolters et al., 2015), finding that executive functioning was related to greater use of passive coping.

Method

Sample

The sample of the present study was collected from different drop-in-centre of Manipur located at Imphal. Based on purposive sampling technique, 100 males who were HIV/AIDS positive and were within age range of 20 to 50 years were taken. The subjects with minimum education level of 8^{th} standard were taken. Subjects with any other co-morbid illness were excluded.

Tools

The following tools were used in the present study:

1. **History taking proforma especially designed for present study:**
   Semi-structured proforma scale was administered for collecting socio-demographic and economic data of the subjects which was developed by the researcher for the present study. Subjects were asked to provide details of their age, gender, educational qualification, marital status, religion, and monthly income, duration of HIV tested and duration of starting ART.
2. **Coping Check List (CCL) (**Rao et al.,1989**):**
   The CCL is a comprehensive checklist of coping behaviour and is the first of its kind validated for use in the Indian setting. It comprises 70 items describing a broad range of behavioural, emotional and cognitive responses that may be used to handle stress. Items are scored dichotomously in a yes/no format, the responses indicating presence or absence of a particular coping behavior. The various coping strategies covered in

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the checklist resulted in 7 subscales: 1 for Problem Solving, 5 for Emotion focused coping (denial/blame, distraction positive, distraction negative acceptance and religion / faith) and 1 for social support seeking. A higher score in each domain denotes greater reliance on that specific strategy. The test retest reliability (over 1 month) is 0.74 and the internal consistency is 0.86 as established by the authors.

3. **NIMHANS Neuropsychological Battery (**Rao et al., 2004**):**

The NIMHANS Neurological Battery consists of a series of tests aimed to assess various aspects of cognitive function including motor speed, attention, memory, language, visual-spatial ability and executive functions. The profile of the Neuropsychological assessment will indicate the patient's deficits and adequacies in different area. The factorial validity of this test is 0.4 which indicates the value is high and is suggestive of adequate reliability of the tests.

The tests selected for the present study are:

A) Finger Tapping Test (Spreen & Strauss, 1998):

Finger tapping Test is used to measure motor speed. It measures the speed with which the index finger of each hand can tap. Tapping speed of each hand is tested separately. The subject taps the tapping key with the index finger of either hand, with his or her preferred hand being tested first. S/he is instructed to tap the key as fast as s/he can, without moving either body or shoulder. The subject is given a total of 5 trials lasting 10 seconds each. Three such consecutive trials are followed by a brief pause of 30 seconds. After the pause, 2 more trials are given for the same hand. A similar procedure is followed for the other

Score: The average number of taps over the 5 trials is calculated for each hand and forms the score for the right hand and left hand.

B) Wisconsin Card Sorting Test (Milner, 1963):

WCST measures set shifting ability. This test examines concept formation, abstract reasoning and the ability to shift cognitive strategies in response to changing environments. The test consists of 128 cards. Stimuli of various forms are printed on the cards. The stimuli vary in terms of three attributes: colour, form and number. The stimuli are geometrical figures of different forms (triangle, star, Cross, circle), in different colours (red, green, yellow, blue) and in different numbers (one, two, three, four), which are presented on each card. The pack of 128 cards consists of two sets of 64 cards each. In addition to these 128 cards, there are 4 stimulus cards. Out of those four stimulus cards, the first card consists of 1 red triangle, the second consists of 2 green stars, the third consists of 3 yellow crosses and the fourth consists of 4 blue circles. There are multiple score in this test.

C) Complex Figure Test (Meyers & Meyers, 1995**):**

This test measures visuo constructive ability and visual memory. Visuo constructive ability requires attention, visuo spatial perception, visuo motor coordination, planning and error correction abilities. An abstract and complex design is copied followed by recall of the same. The subject is asked to recall the figure twice: the first time is an immediate recall three minutes after the copying is completed, and the second time is a delayed recall 30 minutes later. The number of facts correctly reproduced on each occasion forms the score.

Procedure

To proceed with the study, necessary permission was sought from the concerned authorities of different NGO's. They were thoroughly explained about the research programme and the concerned subjects were also informed about the nature of the research study and informed consent is also taken from them to undergo the research.

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They were also informed that confidentiality will be maintain regarding their HIV status and identification like name will not be appeared in any part of the study. A prepared script was read out providing an overview of the study aims and risks and benefits to each subject approached for participation. After this all the subjects were asked to sign the informed consent form if they agree to participate in the study. They have the rights to seek clarification and information about the aspect of the research work. They have the freedom to refuse answer to any particular question and can withdraw the test at any point of time. Once the consent is obtained, brief history of socio-demographic, socio-economic and other relevant data of each subject was elicited on proforma made for the study. The subjects were instructed beforehand regarding the assessment tool.

RESULTS

Table-1: Correlation of Coping Mechanisms and Finger Tapping Test among Males of Experimental Group

Finger Tapping	Dimension of Coping Strategies		
	Problem Focused	Social Support	Emotion Focussed
Righthand	-0.036	-0.012	-0.029
Lefthand	-0.031	-0.048	-0.134

The above table shows the relationships of Finger Tapping Test and coping strategies of males infected by HIV and findings shows no significant relations on any of the scores of finger tapping and coping strategies. This reveals that there is no relationship between coping strategies and motor ability in males.

Table-2: Correlation of Coping Mechanisms and Wisconsin Card Sorting Test among Males of Experimental Group

WCST	Dimension of Coping Strategies		
	Problem Focused	Social Support	Emotion Focused
Total number of correct	0.008	-0.154	0.059
Total number of Error	0.040	0.139	-0.095
Percent Error	0.030	0.152	-0.095
Perseverative Responses	-0.044	0.131	-0.060
Percent Perseverative Responses	-0.050	0.134	-0.057
Perseverative Error	-0.031	0.133	-0.052
Percent Perseverative Error	-0.038	0.142	-0.049
Non Perseverative Error	0.091	0.076	-0.093
Percent Non Perseverative Error	0.087	0.072	-0.095
Conceptual Level Responses	0.000	-0.169	0.090
Percent Conceptual Level Responses	-0.034	-0.152	0.107
Number of Categories Completed	-0.094	-0.136	0.077
Trials to Complete the 1st Category	0.173	0.029	0.100
Failure to Maintain Set	0.143	-0.100	0.101

The above table shows the relationships of Wisconsin card sorting test and coping strategies of males infected by HIV and findings shows no significant relations on any of the scores of WCST and coping strategies. This reveals that there is no relationship between coping strategies and set shifting ability in males.

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Table-3: **Correlation of Coping Mechanisms and Complex Figure Test among Males of Experimental Group**

Complex Figure Test	Dimension of Coping Strategies		
	Problem Focused	**Social Support**	**Emotion Focused**
Copy	0.139	0.028	0.002
Immediate recall	0.068	0.075	-0.094
Delay recall	0.095	0.036	-0.069

The above table highlights the correlation of complex figure test and coping strategies and findings shows no significant relations among them. This reveals that there is no relationship between coping strategies and visuo constructive ability and visual memory in males with HIV/AIDS.

DISCUSSION

The result of the present study indicates that there is no relationship between coping strategies and motor ability in males with HIV/AIDS. Also, there is no relationship between the different coping strategies and set shifting ability and visuo constructive ability and visual memory in males with HIV/AIDS. Motor ability/ motor speed had been assessed using Finger Tapping test. There are several brain structures mediating motor speed (Joseph, 1996). The prefrontal cortex mediates motor planning, the supplementary motor area mediates initiation of motor acts, while the premotor cortex, basal ganglia and the cerebellum mediate fine motor control.motor speed therefore requires integration among the multiple centres, which mediate movement. Motor speed reflects the efficiency of this integration. Set shifting ability is assessed using the Wisconsin Card Sorting Test (WCST). Frontal lobe lesions impair set-shifting ability (Heaton et al., 1993). Set shifting is the ability to change a mental set in response to environmental contingencies (Spreen & Strauss, 1998). It is the ability to adapt responses to a changing environment. Set sifting ability regulates attention, thought, speech,emotion and social behaviour. It requires cognitive flexibility both in formation of a mental set and in the subsequent shifting of the set. The result of the present study has indicated that there is no significant relationship between the kind of coping mechanisms utilized and neuropsychological functions viz., motor ability, set shifting ability, visuo constructive and visual memory of males with HIV/AIDS in Manipur. However, evidence of a study by Billings & Moos, (1981) supports a positive association between good neuropsychological functioning and action-focused coping skills as well as between poor neuropsychological functioning and emotion-focused coping skills. Also, in a study by Jennifer *et al.*, (1997) Regardless of medical symptom status, persons rated as being neuropsychologically impaired in attention/speed of information processing and verbal skills utilized significantly more confrontive coping than did unimpaired subjects. It may be that individuals with difficulty sustaining attention to details or reduced ability to process verbal information resort to impulsive forms of coping because they are less able to assess the precise nature or extent of threat or harm posed by a stressful situation.

The present study focuses only on particular neuropsychological function and its relationship with coping strategies which could be one of the factor for not showing any significant relationships among them. Further study needs to be done by focusing all area neuropsychological function for better understanding of the relationship of coping strategies and neuropsychological functions. However, it should be noted that teaching effective coping

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skills will definitely benefit males with HIV/AIDS. And, it should be focus of some approaches to treatment for this special population.

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