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International Journal of
Psychology and Counselling

October-December 2020
ISSN: 2141-2499
DOI: 10.5897/IJPC
www.academicjournals.org



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Review

Classification of posttraumatic stress disorder and its evolution in Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria

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Received 9 March, 2020; Accepted 18 August, 2020

The purpose of this review is to provide an historical understanding of post- traumatic stress disorder. The concept of trauma is changing drastically in every publication or revision of Diagnostic and Statistical Manual of Mental Disorders. The underlying dimensions of trauma are also under constant consideration. Thus, the paper would provide some historical background of trauma nomenclature. This will enable the researcher to think of future diagnosis and differential diagnosis of traumatic syndromes. Posttraumatic stress disorder has been out there as back as human history. However, the recognition of traumatic symptoms on people's lives and mental health has been recently recognized. Even though non-governmental organizations and civic society drew attention of this issue for a long time, the legal and administrative bodies were reluctant to take action and recognize the effects of traumatic experiences on people's life.

Key words: Post traumatic stress disorder, statistical manual, mental disorders, nomenclature, post-traumatic stress disorder (PTSD), historical evaluation of PTSD.

INTRODUCTION

Obviously wars have adversarial effects on everybody's life whether they have been in combat or not. Vietnam war is the hallmark for the recognition of traumatic stress on public and civic sphere. Many veterans have adjustment, marital, drug and alcohol, and occupational problems after the war. Thus, following WW-II, the American Psychiatric Association (APA) published the first of the series of Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1952. The DSM-I used the name "Gross Stress Reactions" in reference to stress-related experiences. Gross Stress Reactions referred to a reaction to extreme stress, such as war, disasters, fires,

earthquakes or explosions (Berthold and Carlier, 1992). By definition, the disorder was described as acute stress, and in the absence of stress it was suggested to look for another diagnosis. In DSM-I and DSM-II, the categories of gross stress reaction and transient situational disturbance, respectively, were used to describe acute symptomatic distress following adversity; whereas more prolonged disorders were conceptualized as being anxiety or depressive symptoms (Yehuda and McFarlane, 1995).

The APA published the second DSM in 1968. DSM-II did not include a specific category for stress related

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reactions. However, it recognized that extreme stress could be followed by mental health problems in that it included the diagnostic category of "Temporary Situational Disorder" (O'Brien, 1998). This category was intended to define reactions to unusual stress caused by anything from unwanted pregnancy to a death sentence (Berthold and Carlier, 1992). However, such stress was seen as a self-limiting condition. It was felt that chronic problems occurred only in those with severe pre-morbid personality disturbances. In those cases, the condition was solidified into a recognizable psychiatric disorder.

VIETNAM ERA AND CONTRIBUTIONS OF WAR

The Vietnam War was definitely a turning point in the history of posttraumatic stress disorder. Post-traumatic Stress Disorder (PTSD) was not a particularly popular topic before Vietnam. Even though the APA had published two DSM manuals and did some modification in the definition of extreme stress and traumatic experiences, literature provides very few studies concerning traumatic stress. In early studies, it was reported that Vietnam had low rates of psychiatric casualties (Jones, 1967). However, later studies suggested that 300,000 to 700,000 or more of the 3,000,000 who served in Vietnam had PTSD (O'Brien, 1998). Some studies had focused on Holocaust survivors and women who had suffered violent sexual crimes, but the Vietnam War was the essential element in the development of the diagnosis of PTSD.

The Vietnam War is said to have been different from other wars. It was unpopular, prolonged, low intensity, distant, a guerilla conflict, and lost by Americans. Moreover, during the era, peace was socially more accepted than war. Thus, Vietnam veterans were not welcomed as heroes. Gradually, a database was developed and small-scale studies were conducted, especially single case studies, which were done in many hospitals and research centers. Then, Vietnam began to be associated with social problems, poor integration in society, criminal behavior, mental health problems, divorce, and substance and alcohol abuse (O'Brien, 1998). Despite the much lower rates of acute illness, there were apparently much higher rates of chronic illness such as PTSD in veterans after they left the army. In line with that, a series of books, films, television programs, and newspaper articles, emphasized the plight of veterans who had been marginalized and socially handicapped. There were some attempts to get government involvement in this new issue.

However, Congress constantly refused to fund any rehabilitation, intervention or prevention programs for Vietnam veterans. Nonetheless, finally in 1979 Congress agreed to subsidize services for Vietnam veterans with readjustment problems (Kelly, 1985). These adjustment problems were described as "a low-grade motivational and behavioral impairment with a victim's overall ability to

cope reasonably with his daily life." A readjustment problem does not usually amount to a definable psychiatric illness. However, with new funding, new hospital and treatment centers opened, more professionals were hired, and large scale data were collected. Therefore, most of today's current knowledge about the etiology, prevalence, and treatment is based widely on Vietnam War veteran studies. The Vietnam phenomenon led the way to defining a new classification in 1980, when PTSD was officially identified for the first time (APA, 1980).

Historical, political, and social forces have played a major role in the acceptance of the idea of trauma as a cause of the specific symptoms of PTSD (Yehuda and McFarlane, 1995). Political turbulence, atrocities, and ethnic genocide as well as civil and guerilla wars in different parts of the world in the late 70's and early 80's, (for example, communist oppression in Cambodia, Vietnam, guerilla wars in Latin America, and civil war in Lebanon, and Revolution in Iran) caused many to be persecuted, tortured and exiled from their own homeland and millions of refugees sought a safe haven in Western Europe and North America. Studies of political persecution and big tides of exodus shed more light on our understanding of the dynamics of trauma and its long-term effects. Thus, the formulation of PTSD as a normative and adaptive response to trauma in the DSM-III addressed social and political issues as well as mental health issues. From a social and political perspective, PTSD as a concept has done much to assist in the recognition of the rights and needs of victims who have been stigmatized, misunderstood, or ignored by the mental health field.

The APA acknowledged the role of trauma in the etiology of certain psychological symptoms in 1980. Before that time, traumatic symptoms (hysteria) were seen as an individual pathology, rather than caused by external factors. In 1980, the construct of PTSD was incorporated into the DSM-III, Diagnostic and Statistical Manual of Mental Disorders, and there was a move away from looking at pre-morbid vulnerability as the contributing factor. At the same time, the construct of "hysteria" disappeared from the DSM system, and was divided into several different mental disorders (van der Kolk et al., 1996b).

The introduction of the new diagnosis PTSD was the recognition of the psychic consequences of war, especially as experienced by Vietnam veterans (Berthold and Carlier, 1992). The early studies reported a lot of similar symptoms and emotional and behavioral reactions to disaster, war, and trauma experience. However, it was not until 1980 that the diagnostic category of PTSD was officially introduced in the DSM-III American Psychiatric Association (APA) because evidence gained from empirical studies suggested that the impairment following extreme adversity is etiologically and phenomenologically different from what it was originally thought to be. With

the DSM-III (1980), PTSD was classified as an anxiety disorder with social, emotional and behavioral dimensions (Foy et al., 1987). When the diagnosis of PTSD was first introduced in 1980, 12 symptoms were specified, clustered into three groups: Criterion Set B (3 re-experiencing symptoms; that is, recurrent and intrusive recollections of the traumatic event, such as flashbacks and nightmares), set C (3 symptoms representing numbing of responsiveness; restricted affect) and Set D (6 other symptoms, including symptoms of hyperarousal, avoidance of trauma-related stimuli, and guilt about surviving the trauma). An individual must present at least one re-experiencing, three avoidance, and two arousal symptoms to be diagnosed with PTSD (Taylor et al., 1998). DSM-III is the first classification which considered the role of external environmental elements as triggering factors.

However, some important issues remained unresolved (McFarlane, 1988b). The first problem was that the reliability of DSM-III was established in outpatient settings. This led to some problems in discriminating between war and disaster-related experiences. Even though the DSM-III was published sometime after the Vietnam War, the initial reports showed a very low prevalence of psychiatric disorders during the war. In the following years, thousands of veterans flooded into hospitals and became involved in many social, marital, and criminal behaviors, drug addiction, and other psychiatric disorders. Then the delayed recognition of substantial psychiatric morbidity gained more attention and changed the clinician's understanding of the early phenomenology of PTSD and other disorders. On the other hand, many veterans demonstrated significant achievements and adaptations in their private as well as social life (Breslau and Brenner, 1987). Secondly, other studies (Saigh, 1991; Solomon and Canino, 1990; Yehuda and McFarlane, 1995) reported that a majority of patients with PTSD diagnosis had some other concurrent psychiatric diagnosis. These comorbidity issues had been cited in many resources and gave way to consider a new classification. Most studies assess PTSD reports either in terms of rates of full-blown diagnosis, or else in terms of undefined partial or subclinical levels (Solomon et al., 1989). Criteria C and D are misplaced and, in fact, are symptoms of other disorders such as depression or anxiety, and therefore resulted in artificially high rates of co-morbidity diagnoses. Breslau and Brenner (1987) argued that the DSM-III diagnosis was based on face validity (expert consensus). They further claimed that PTSD overlaps with other disorders, especially with generalized anxiety disorders, phobia, and depression. In defining the symptoms of PTSD, there is a clear overlap with psychoanalytically defined anxiety neurotic symptoms, such as depersonalization, de-realization, obsession and compulsions, histrionic behavior, and mood disturbance. Both the theoretical connection with neurosis through the re-experiencing of the trauma and

the phenomenological similarity in clinical symptoms make it clear that DSM-III PTSD is in fact a special case of the psychoanalytic construct of neurosis in which affective components are especially intense (Breslau and Brenner, 1987). The suggested new criteria included a) existence of a severe stressor, and b) the re-experiencing of the trauma. Re-experiencing of the trauma does not occur with other disorders. Similarly, a connection was seen between the stressor and an adjustment disorder. However, adjustment disorder was not defined in DSM-III as a distinctive category. Common significant distress or the stress "outside of usual human experience" did not provide a definitive rule in determining PTSD. For example, common stressful experiences did not qualify a person for PTSD, but chronic illness, man-made disasters, and natural disasters did qualify an individual for PTSD diagnosis. Solomon and Canino (1990) provided empirical findings and argued that common stressful events such as moving, money problems, breaking-up with a best friend, involuntarily taking someone into the home, and similar incidents are more closely related to PTSD than life events are. Their results suggested that the definition of trauma as "outside the range of usual human experience" is inappropriate. Because some problems attached to DSM-III criteria and children's reactions were not specifically addressed, some researchers (Galante and Foa, 1986; McFarlane et al., 1987) continued to use instruments that measure aggression, school problems, depression etc. in order to identify emotional problems. Rutter Behavioral Questionnaires and Beck Depression Inventories (both instruments had parents' and teachers' forms available) were commonly used to assess "posttraumatic phenomena" (McFarlane et al., 1987) reactions in children.

Then in the following years the DSM-III was revised again (APA, 1987) and the symptom list was modified again and expanded to 17 symptoms. Set B was increased to 5 re-experiencing symptoms. Set C was increased to 7 symptoms by including avoidance and numbing symptoms, and set D was refined to include 5 symptoms of hyperarousal. The symptom regarding survivor guilt was dropped from the list. Moreover, the DSM -III-R classification did not distinguish between acute and chronic PTSD (Foy et al., 1987).

Thus far, it is clear how often emphasis was put on the temporary or reactive aspects of PTSD while extending the stressor group to include a much broader spectrum of undesired experiences. Discussion about the reactive and temporary nature of the "stress reaction" became a major argument after 1980. The duration of time of a reaction to a stress was being argued. Finally, in DSM-III-R, duration of the emotional state of discomfort of at least one month was required, but the general opinion was that the one month stipulation was purely arbitrary (Berthold and Carlier, 1992). The symptoms in the DSM-III-R were retained in the DSM-IV (American Psychiatric Association,

1994), with the only exception being that one of the symptoms from Set D was reallocated to set B. One of the most significant changes was to acknowledge that children might react to a traumatic event with disorganized and agitated behavior (APA, 1994). Previous classical studies cited some regressive behavioral patterns as symptoms of stress. Conversely, the DSM-IV discarded the criterion of "loss of newly learned skills." Palmer (2001) brought up another criticism, saying that although the DSM-IV is being used extensively by mental health professionals as a basis for diagnostic and treatment purposes, the construct of disorders within the DSM-IV has not been empirically validated.

The most current version of the DSM is the Fourth Edition, Text Revision (DSM-IV-TR; 2000), published in June 2000 by the American Psychiatric Association. Similar symptoms are employed in their revised edition as well. PTSD is officially classified as an anxiety disorder, but some have argued that it fits more closely with the dissociative disorders, and others feel it belongs by itself. While some consider PTSD the pure and only result of trauma, some studies present various symptoms as related to this theme. Depression, anxiety, and dissociation are three disorders that may sometimes arise after the traumatic experience. Dissociation is a fairly normal coping strategy in the face of overwhelming stress, but extreme dissociative tendencies may be pathological. The current understanding of dissociation with regard to PTSD is very close to Janet (1911)'s explanations. In addition, some researchers have also reported somatoform reactions. There has also been discussion over differential diagnoses for simple vs. chronic traumatic histories. Classification issues such as these will continue through field trials for the DSM-V (Magritte, 2000).

In 2013, American Psychiatric Association revised the criteria for PTSD, which requires the following criteria: re-experiencing the event, alterations in arousal, avoidance, negative alterations in cognition and mood (APA, 2013). It also requires a clinically significant distress or impairment in social, occupational or other important areas of human functioning. This should last at least one month or longer and the disturbance should not be caused by substance or medical condition.

CONCLUSIONS

As the time progress and the clinical and theoretical experiences grow, new information would accumulate and help us to understand better the phenomenon of traumatic experiences. By itself, PTSD is very complex and heterogeneous set of symptoms that may resemble anxiety or affective disorder. Psychiatrist, psychologist and mental health workers are making bit-by-bit progress to fully understand this phenomenon. Especially, neurological sciences and cognitive sciences are discovering new advances to help us to fully understand

this mysterious experience. This paper should serve for the purpose of these gaps.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

Loss and grief counseling as a coping mechanism of widowhood: A comparative study of widowers and widows in Meru County Kenya

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Received 18 June, 2019; Accepted 26 August, 2020

Widowhood has been on increase globally and Kenya as nation is not exceptional. The state of widowhood globally has been made worse during this period of Corona Virus Disease which started in Wuhan in China in December 2019 (WHO, 2019). Losing a spouse through death is quite emotive and may affect the bereaved persons' psychosocial wellbeing as well as coping mechanism. In Meru community of Kenya, few researches have been done on counselling as a coping mechanism of widowhood. The study's main purpose was to determine how loss and grief counselling is used as a coping mechanism by comparing widowers and widows in Meru County Kenya. A descriptive survey was employed in the study where ex post facto's causal-comparative research design was appropriately used. A total population of 80,332 widowed persons in Meru County was targeted. For comparison purposes, a total sample size of 384 respondents was used; half from each gender. Questionnaires and Focus Group Discussions were used to collect data from respondents based on gender. Both descriptive and inferential statistics were employed. Widows sought for loss and grief counselling more at 61% than widowers at 47 % and from FGDs more than 70% and less than 20% respectively. From t-test results there was a statistically significant difference which favored widows than widowers in seeking for counselling services. In conclusion, the study findings may assist the widows and widowers to seek timely loss and grief counselling services as a positive coping mechanism.

Key words: Widowhood, loss and grief counselling, coping mechanism, psychosocial wellbeing, widow/widowers.

INTRODUCTION

People from diverse cultures react to various losses in a variety of ways as well as experiencing grief differently. Behavioral and emotional responses to loss include many symptoms such as sadness, preoccupation with many thoughts and activities which may lead to depression,

anxiety or numbness portrayed by the trauma survivor (Magnuson and Enright, 2008). A grieving widow or widower might show strong feelings or no feelings interchangeably hence showing how differently people cope with loss and grief. Many people experience pain

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and apply different coping mechanisms during the COVID-19 pandemic. Grief is a normal reaction to loss during or after a misfortune or other painful experience that people encounter. Grief can happen in response to loss of life, and to drastic changes to daily routines and ways of life that usually bring us comfort and a feeling of stability prompting them to use various coping mechanisms which vary with gender, age, duration, situation and environment (Center for Disease Control, 2019). Stroebe and Schut (1999) published their two process model of coping with bereavement. The model proposes that there are two effective ways of coping with bereavement which include loss-oriented and restoration-oriented processes. The model notes that clients interject between the two processes until one reaches a stable state of calmness in life. This model may be useful to widows and widowers since they experience mixed emotions after spousal death. Loss and grief counselling is the process of helping the widowed men and women going through the five psychological bereavement stages successfully. This is by seeking services from a service provider who is empathetic, warm and understanding. The process of dying and death itself are the most complex facts of human being to face among many life challenges (Axelrod, 2018). The widowed person must be prepared for good and bad days as they reorganize their lives especially during the early stages of recovery from loss of loved spouse. The loss and grief counselor should use the skill of empathy to assist the bereaved person go through the ventilation process successfully in order to replace negative emotions with positive ones. The widowed person can be helped to replace desperate situations with hopeful ones in future. In order to live harmoniously the widowed person is helped to deal with guilt feelings of by forgiving, fearfulness with courage and finally acceptance which results to a person's calm state. It is beneficial to assist the bereaved person find substitute for the loss of spouse experienced since it is a positive coping strategy (Appel and Papaikonomou, 2013). The grieving person should be helped to live a fully satisfying life by being productive and a fulfilling life that is really worthwhile a (Appel and Papaikonomou, 2013). Grief being the deepest human emotion impacts on psychosocial life of a person. This is made manifest in deep sorrow as a result of spousal separation, loss of loved one, natural disaster such as earthquakes and floods, miscarriage, job loss at whichever level, emptiness and hopelessness or denial those widows and widowers experience (Ng'eno and Chebogut 2010). The study proposes that, though it is normal for the client to feel guilty and since guilt is self-imposed, it requires to be put into a proper perspective by the client coping positively. This means that the client should not ignore the positive dimensions of the relationship with the deceased. The clients can also share the hurting feeling with others who have suffered spousal losses before for psychosocial support. It is important to talk about

such loss with friends, relatives, counsellors and other service providers which have a cathartic effect. A support group may be an excellent source of guidance, security and trust working through a person's grief with others. This support also helps combat the loneliness that is prevented following the loss of a loved one instead of using negative coping mechanisms which can lead to depression such as drug and substance abuse (Limann, 2003).

A United States survey revealed that when people are in a crisis, 42% seek pastor's counselling, 31% go to a psychologist, psychiatric or marriage counselor, whereas 29% go to their family doctor (Urassa, 2001). Death, as a form of crisis makes a person unable to solve problems and as a result experiences anxiety, guilt, restlessness, and disturbances life. However, bereaved persons experiencing pathological grief can be helped in the path towards psychotherapy healing. The client should acknowledge their grief and seek counselling as a healing process since it is a positive coping mechanism. The major role of mental service provider during loss helps the bereaved to remain focused. The therapist should finally help them by using listening skill until they understand themselves clearly and solve their own problems in life. The therapist's challenge is to listen to the bereaved client and assist him or her deal with grief as come to a consensus. The other greatest challenge is on the part of the person who has experienced loss and their ability to express feelings after loss of loved ones (Malkinson, 2010). The stages of mourning and grief are universal and are experienced by widowed persons in differently depending on their cultural background and the duration lived with the deceased. Mourning occurs in response to a widowed person loss of a loved one (Wolfelt, 2003). There are five stages of normal grief according to Elisabeth Kubler-Ross (1969) book "On Death and Dying" (Axelrod, 2018). The first stage is Denial and Isolation which forms the first reaction after one learns of a death of loved one. The person enters denial stage of the reality and has wishful thoughts that it is not true. There are overwhelming and mixed emotions that the grieved person experiences. The second stage is anger where the person become furious with self or God. They have wishful thoughts that one could have put effort to stop the death of the loved one. Hatred to God, self and others develops and if this prolongs it causes psychological injury to the person. The third stage is bargaining where the person argues with and question self, others and God. The person prefers the loss to be for others and not them. In the case of widows and widowers they express the hurting feelings to self, others or even God; they always belief that somebody or something could have stopped the spousal loss. The fourth stage is depression, where the person in grief is saddened by the loss of spouse. The client manifests feelings of helplessness and becomes more vulnerable to life challenges. This is where they arrive at a consensus

with self or God in an attempt to procrastinate the inevitable without success. However, this is a weaker defense mechanism to protect them from the pain due to self-blame (Urassa, 2001). The final stage is acceptance of reality that death has occurred and is irreversible. This brings healing to the person in grief and is a stage marked with calmness and feelings of normalcy. Therefore, coping with such a loss is an individual decision and require counselling services as a positive coping mechanism (Axelrod).

Globally, widowers cope by remarriage, career advancement and engaging in businesses, while widows mostly use religion, support groups and counselling as a coping mechanism (Wolfelt, 2003). Men discover their loneliness more than women after spousal death since they used to live with parents before living with a marriage partner. The loss creates a vacuum in their lives with sudden impact (Wolfelt, 2003). This becomes more complex especially for those married for a longer period or have growing healthy families. In such cases, being alone after spousal death is a big challenge and some people turn to getting a pet, write in a journal about death, praying and meditation, use relaxation techniques and exercises as coping mechanisms (Wolfelt, 2003). In South Africa, many communities experience multiple trauma, mostly family murders, community and domestic violence (Statistics South Africa, 2014). Rosenblatt and Nkosi (2007) on prolonged isolation and suffering of widows in South Africa from Southern Cape Town communities as well as the difficulties of this occurrence in a transitional society found that the widows were discriminated and some joined support groups based on race to cope with widowhood. Rashe (2008) studied women experiencing intimate partner violence with little recourse to help and their coping mechanisms. Rashe (2008) further found out that widows seek for support but left out widowers which this paper covered. However, literatures on widowhood from a Western worldview do not consider gender issues in widowhood as in Africa. Western view loss, grief or trauma as an individual experience; which can be dealt with in isolation and regular life resumes after it has been appropriately addressed without considering African cultures which are communal in nature (Breen and O'Connor, 2007). Therefore, to fill this gap, this paper compared widows and widowers in seeking loss and grief counseling services as widowhood coping mechanism.

The widow or widower may genuinely feel blameworthy and cope through projection. This is a weak defense mechanism because their self-blaming thoughts and blame to others are unrealistic since they are overly harsh on themselves and others. They stretch their imaginations to believe they would have or others may have prevented death. They feel guilty as if they had intentionally brought themselves or others harm or to the deceased, which is rarely the case. However, all people feel guilty during a time of loss. What widowed persons

do is to get a support system to help them sort out these feelings by minimizing the unrealistic guilt. Seeking counselling services can help to separate realistic from unrealistic guilt by asking questions during the recoil stage, where many widowed persons are not prepared for the negative feelings that are experienced. As a result, some widowed persons do not seek for counselling services in order to cope with their state of widowhood and that has diverse challenges such as depressive episodes, isolation and low self-esteem. Researches done showed that generally, men do not seek for counselling services like women. This is worsened by Meru cultural expectations that men should be brave, hardy and ready to face any challenge including death, unlike women who are viewed as weaker sex. That is why this study was conducted to establish whether differences existed in seeking for loss and grief counselling services by widows and widowers in Meru County of Kenya.

METHODOLOGY

Research design

The approach of this study was a descriptive survey where causal-comparative research design of *Ex post facto* was used. Comparison between widows and widowers were done to find out how they used loss and grief counselling as a coping mechanism of widowhood in Meru County, Kenya.

Sample size

The researcher adopted simple random sampling to sample four sub-counties from the eight sub-counties in Meru County, Kenya. According to Ogula (1998), a sample size of 384 is acceptable for a descriptive research population of 100,000. Sample size of 384 was selected from a targeted population of 80,332. Out of the selected 384 widowed persons, widows were 192 and widowers, 192. From 192 widows and widowers respectively, 48 were sampled in each case in every sub-county using purposive sampling method.

Data collection instrument and procedures

The study used questionnaires and Focus Group Discussions for data collection. The questionnaire items were both open and closed-ended. The detailed information from the respondents was gathered using Focus Group Discussions (FGDs). This was by probing further on loss and grief counselling services as a coping mechanism used by widowed. The information collected was recorded in a reference list to assist the researcher in data analysis. This was done after receiving consent from the respondents.

Data analysis

Loss and grief counselling as a widowhood coping mechanism was expounded to establish existing differences in seeking for counselling services by widows and widowers. The data collected using questionnaires and Focus Group Discussions was descriptively and inferentially analyzed. Descriptive statistics included percentages, frequencies and means. The t-test from

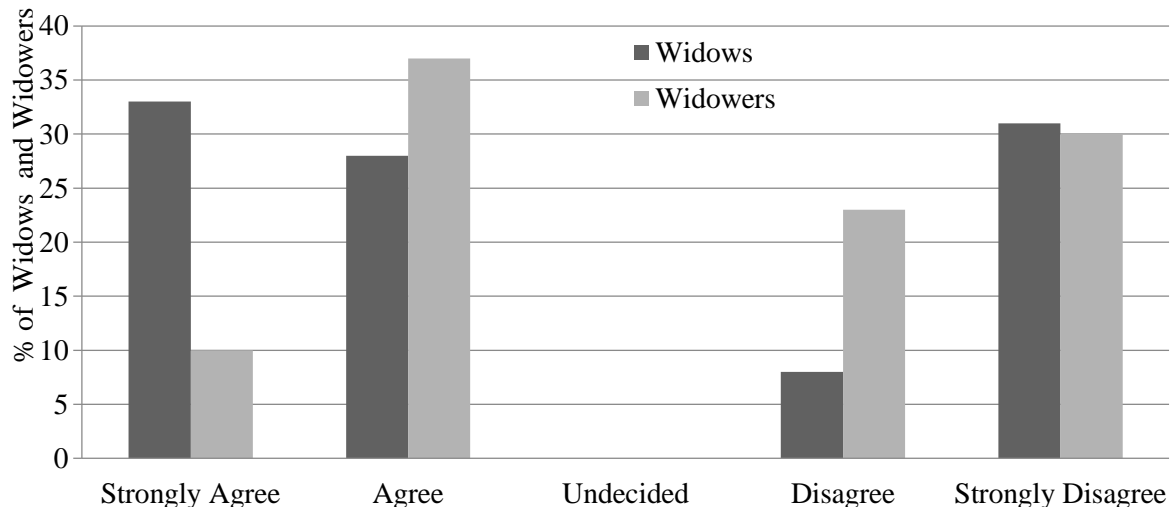


Figure 1. Loss and grief counselling services as a widowhood coping mechanism.

Table 1. Comparison of loss and grief Counselling as Widowhood Coping Mechanism.

Category	N	Mean	t-value	Df	p-value
Widows	192	3.24	26.50*	1	0.000
Widowers	192	1.69			

*denotes significance at $\alpha = 0.05$.

inferential statistics was included to enable the researcher to compare means of widows and widowers. T-test is a statistical tool used in comparing the mean of two groups (Mugenda and Mugenda, 1999). Loss and grief counselling as coping mechanism based on gender was established. The significance level of $\alpha = 0.05$ was accepted. Data collected was entered and analyzed using SPSS version 17. SPSS software is a comprehensive, integrated collection of tools used in managing, analysis and displaying data (Borg, 1996). The data analysis results were presented using frequency and percentages. From the Focus Group Discussions, some excerpts giving the responses of widows and widowers were presented in summaries, narrations and themes. These gave more detailed information on loss and grief counselling as a coping mechanism of widowhood of widowed persons based on gender.

RESULTS OF THE RESEARCH

Seeking loss and grief counselling by widows and widowers

Loss and grief counselling is the process of helping the widowed men and women to go through all the bereavement stages. Results on Loss and Grief Counselling as a Coping Mechanism for Widowed Persons are presented in Figure 1. As noted in Figure 1, a higher number of widowed women seek counseling services where 33% strongly agreed and 28% agreed; thus, 61% of widows sought counselling services.

Widowed men however, who strongly agreed were 10% and those who agreed were 37% hence 47% of widowers sought counselling services. This could be attributed to widowed men being more introverted than women and as a result they do not share their problems. This is further supported by a higher number of widowers who disagreed (23%) and strongly disagreed (31%) with getting counselling services, unlike widows who disagreed at 8% and strongly Disagreed at 30%. To shed more light, means, SDs and Independent Sample t-test analysis, on counselling as a widowhood coping mechanism was computed as shown in Table 1.

The findings in Table 1 show that there exist differences in mean between widows and widowers joining or seeking loss and grief counselling services as a coping mechanism of widowhood. Widows surpassed the widowers in seeking for these services. The widows' mean was 3.24, while widowers mean was 1.69. This implies that, widows turn to loss and grief counselling as a coping mechanism more than widowers. On the contrary of the main study, widowers coped more by remarriage, career advancement and engaging in businesses, while widows mostly use religion, support groups and loss and grief counselling services as a coping mechanism (Mburugu, 2015) women discover their loneliness more than men after spousal death since they used to live with parents before living with a

marriage partner. The loss creates a vacuum in their lives with sudden impact (Wolfelt, 2003). This becomes more complex especially for those married for a longer period or have growing healthy families. In such cases, being alone after spousal death is a big challenge and some people turn to getting a pet, write in a journal about death, praying and meditation, use relaxation techniques and exercises as coping mechanisms (Wolfelt, 2003). Furthermore, mean scores and standard deviations (SDs) gave substantive differences on loss and grief counselling as coping mechanism. The t-value of $t=26.50$, $P < 0.05$ indicates a statistical significant variance in loss and grief counselling of widows and widowers in Meru County. Majority of widows acknowledge the use of loss and grief counselling services as a major coping mechanism in the Focus Group Discussions held, unlike widowers. This generated a qualitative data as shown in Excerpt 1. (The names used in Excerpt 1 are not real names).

Excerpt 1

Researcher: Do you seek for loss and grief counselling services as a coping mechanism after the loss of your spouse?

Doreen (Widow): That is a big help, having somebody close to tell my problems has made me a better woman. I usually share my problems to a male friend whom I trust and life has changed for better.

Erick (widower): After I joined church life has been positive. I usually share my loss and grief problems with my pastor. I also got to know a female friend closely who has helped me go through bereavement.

Medline (Widow): I suffered a lot when I lost my husband through tragic road accident. I went into denial until after burial. I was referred to a counsellor by my friend who had earlier lost her husband a year before. The counsellor helped me to overcome the grief process successfully by taking me through five stages of denial, anger, bargaining, depression and acceptance. Currently, I now assist other widowed persons in my support group to seek loss and grief counselling services from a qualified counsellor.

Martin (widower): After I lost my wife through child birth of our second born child I was in denial until the child who survived became a teenager. However, I did not seek any counselling services since in my community men are socialized to face any challenge and hardship in life. My son is always my consolation since I see the life of my late wife in him.

From the sampled respondents, Focus Group Discussions revealed that more than 70% of widows expressed the need to have either a counsellor, pastor,

friend, either male or female who they share their loss and grief problems with. Therefore, this made them seek for counselling services from the service providers in order to cope with the new life of widowhood. However, from the FGDs conducted, less than 20% of widowers in Meru County engage in counseling, as these services are believed to be designed majorly for women. Widowers are naturally uncomfortable in conditions where open emotional expression is encouraged as it is not their ideal way to grieve (Murray, 1990). Cultural perception also makes the widowers avoid seeking counselling services, since it is viewed as cowardice act in Meru community. Cross cultural counselling brings sensitive issue when working with clients and especially where western and traditional frameworks meet (Nembahe, 1998). A study by Brown et al. (2000) found out that the background analysis of black women and depression as well as grief assessment through cultural backgrounds brings a new approach; where a rigorous method is applied in group context based on widows and widowers' loss and grief culture.

Conclusion

Differences exist in widowhood coping mechanisms among widowed persons based on gender. Widows cope better in their state of widowhood by seeking for loss and grief counselling services than widowed men. In conclusion women prefer to seek for counseling services by sharing their issues in FGDs more than widowers. The widowers are hesitant to open up their issues. The study further established that young widows prefer counseling services than old widows.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Full Length Research Paper

A qualitative study of psychological support needs of family caregivers of hospitalized Lassa fever patients during an outbreak in an endemic state in Nigeria

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Received 20 March, 2020; Accepted 10 September, 2020

The study assessed the emotional reactions and perceptions of stigmatization among family caregivers of Lassa fever patients. Six focus group discussions were held among 48 purposively selected and consenting family caregivers in a Lassa fever treatment facility in South-South Nigeria during an outbreak. An interview guide structured to elicit views and perceptions on Lassa fever, reactions to the news of a positive result stigma, sources of emotional and social support was used for data collection. Data were transcribed, coded, and analyzed along thematic areas. Awareness of Lassa fever was high among the participants. Reactions to a positive test result included emotions of panic, denial, anxiety, and fear. Some respondents expressed their unwillingness to disclose a positive test result; some felt Lassa fever was stigmatized in the community and by healthcare workers. Majority turned to religion as a source of emotional support. Family caregivers of Lassa fever patients experienced varied emotional reactions upon receipt of the news of a positive test result. Some caregivers had been stigmatized by health workers or feared stigmatization at community level. Psychosocial support was obtained from religion and emotional support from survivors and isolation ward healthcare workers. Community health education should be sustained to avoid stigmatization of victims. Pre- and post-test counselling, access to relevant information and psychosocial support should be made available family care givers.

Key words: Fear, Lassa fever, stigma.

INTRODUCTION

Outbreaks of highly infectious diseases create a public health crisis as they increase morbidity and mortality, disrupt routine preventive and curative health services, and overstretch medical infrastructure. Under certain

circumstances such as rising mortality from the disease, poor public understanding of transmission and perceived severity of the disease, infectious disease outbreaks generate a social response by the public that can

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potentially disrupt the social milieu and cohesion of communities. A social response in this context means the behavioural or emotional display of concern shown by the public in response to an outbreak (Fast et al., 2015). Such responses include panic, frustration and fear, and in extreme cases, stigmatization and violence against persons believed to have the disease (Fast et al., 2015). Public health precautionary measures that include exclusionary practices to the affected can further exacerbate this social response with the introduction of stigmatization and discrimination against persons perceived to be responsible for the outbreak. Such reactions have been reported during Severe Acute Respiratory Syndrome (SARS) outbreak in Hong Kong (Cheng, 2004) and Ebola outbreak in Uganda (Kinsman, 2012). Outbreak response strategies then will include both an epidemiological and a social process. The epidemiological process is required to identify appropriate containment measures and culminates in the initiation or scale up of public health actions that eventually control the outbreak (Kinsman, 2012). The social response addresses the public's reaction to the disease. Stigmatization is the process of negative discrimination against people with certain physical, behavioural, or social attributes (Barrett and Brown, 2008; Perry and Donini-Lenhoff, 2010; Fischer et al., 2019). Applied to infectious disease outbreaks, social stigmatization results from a perceived link between a person or persons known or perceived to have the disease, be a carrier or a contact to an infected person (UNICEF, 2020). Such negative perceptions and treatment can impact negatively on those with the disease, extending to their family caregivers and communities (United Nations Children's Fund [UNICEF], 2020). Social stigma represents an obstacle to infectious disease outbreak control. Fear of stigmatization can lead to concealment of and denial of Lassa fever symptoms. Delay in seeking medical attention leads to late detection, delayed onset of treatment and community spread of the disease (Barrett and Brown, 2008). Indirect effects of discrimination and social marginalization of infected person or their families are neglect and poverty, further increasing their susceptibility to Lassa fever. Stigmatized populations may display distrust towards public health authorities and resist government assistance even at the expense of their health and wellbeing (Barrett and Brown, 2008). Violence against a stigmatized group has been known to occur (Perry and Donini-Lenhoff, 2010). Social stigmatization may be extended to family caregivers, who are vital to provide financial, emotional and physical care and support to the sick (Oyebode, 2003). Family caregivers accompany patients to the health facility and may assist with admission formalities. In situations where health workers are in short supply and overstretched, family caregivers to patients in general wards may be called upon to assist with a variety of bedside activities such as bathing, dressing and feeding (Islam et al., 2014).

Lassa fever is a highly infectious haemorrhagic illness caused by a virus belonging to the family Arenaviridae. It is spread from the *Mastomys natalensis* rodent reservoir to man through contact with rodent excreta or urine in food or during hunting and processing of rats for consumption. Human to human spread occurs within households during care for sick relatives or in health care settings (Bonwitt et al., 2017). Lassa fever seasonal outbreaks occur annually in Sierra Leone, Guinea and Nigeria. Sporadic outbreaks have been reported in Ghana, and Ivory Coast, Senegal and Mali (Ogbua et al., 2007). In Nigeria, the number of states reporting Lassa fever has increased from 19 in 2017 to 27 in 2020 (Nigeria Centre for Disease Control [NCDC], 2017). Edo state records the highest number of cases annually.

While 80% of infections are subclinical, 15 to 20% of infected persons develop clinical illness that requires hospitalization in designated treatment facilities where isolation precautions and restricted access regulations prevent nosocomial transmissions.

Reports of patients and their family caregivers alienated by health care workers and the community have followed a laboratory confirmation of Lassa fever or other viral haemorrhagic fevers (Kuriansky and Toriello, 2016; Mmadu-Okoli, 2019; Richmond and Baglole, 2003). Aside from this, Lassa fever patients and their caregivers are often left in the dark as to the nature of treatment, isolation and the need for it, and how to protect themselves during hospital stay with their sick patients.

No study has been conducted to assess stigmatization or discrimination among family caregivers of Lassa fever patients in Nigeria. A study of psychosocial state and perceived stigma among family caregivers is pertinent to inform the design of interventions to provide psychosocial support to caregivers.

MATERIALS AND METHODS

Study area

The study was conducted at Irrua Specialist Teaching Hospital (ISTH) in Edo State, Nigeria. The tertiary facility is located in Irrua, the headquarters of Esan Central Local Government Area. Commissioned on 21st of November 1991, the institution provides comprehensive preventive, promotive, curative, and rehabilitative health services to the people of Edo and neighbouring states. It is a centre of training for medical professionals and nurses, and home to the Institute of Lassa Fever Research and Control (ILFRC), the designated national centre for the management of Lassa fever. The hospital has several out-stations from where outreach services are provided to surrounding communities.

Study population

Purposive sampling technique was used for participant recruitment. Purposive sampling involves identifying and interviewing persons whose contributions would be most informative in addressing the research questions and unravelling the phenomenon of interest

(Fergie et al., 2013). This method was chosen because the study sought to get first-hand information from family members who were involved in any manner in care of the patient. Thus, consenting blood relatives of Lassa fever confirmed patients admitted for not less than 24 h in the Lassa fever isolation ward of the ILFRC and who were with the patient for not less than 24 h prior to and during the time of admission and aged over 18 years were recruited.

Study design

Qualitative research methods were chosen as the study sought to explore the personal experiences of family caregivers of Lassa fever patients, and document in their own words, the range of emotional and psychological states they went through during the period, without presenting them with preconceived options from the researcher (Mohajan and Mohajan, 2018). With the scarcity of published data on the topic, this method generates information that provides the framework upon which future quantitative studies to investigate associations can be conducted.

The study was conducted between December 2017 and March 2018, which coincided with the outbreak of Lassa fever.

Data collection

Focus group discussions (FGD) were used for data collection. FGDs involve organized discussions with a group of persons to gain insight into their views, experiences and perspectives on a topic (Sharif and Masoumi, 2005). This method was chosen as it is easy to conduct, and the interaction of participants in the group allows for the exploration of all the dimensions of a subject matter simultaneously (Vazquez-Lago et al., 2012).

Six FGDs were held with groups consisting of 6 to 9 participants with a mix of educational level, sex and ethnicity in each group. Four scientific officers of ISTH and the head matron of the isolation ward, who had been trained on data collection for a FGD by the researchers, supported with group formation, note-taking, audio cassette recording, time keeping and observation were used. The researchers moderated all the sessions. With the aid of a FGD guide, discussion topics were introduced. Opening, topical and probing questions were asked. Opening questions were typically "icebreakers" that served as preludes to topical questions; they were used to stimulate interest in the group process, and to elicit the participants' initial perceptions about the general theme. Topical questions directly addressed the topical themes. Probing questions were follow-up questions to obtain more details and clarifications on responses given to topical questions. The general topical themes for the discussions included: awareness of Lassa fever, perceptions of stigma by health workers and the community, sources of emotional and social support, and planned behavioural change in favour of adoption of preventive practices.

The sitting arrangement at each session allowed easy eye contact and hearing between the facilitators and the participants. The participants were encouraged to talk freely and spontaneously. Discussions during the FGDs were written down as field notes and audio taped. Each session lasted for 1 to 2 h as allowed by the participants.

Data analysis

All audio recordings were transcribed verbatim, and speeches recorded in pidgin English were transcribed to English and content-analysed by a process of repeatedly listening to the recordings and reading through the notes, identifying common threads in relation to the questions. Broad themes were coded and used to organize the

information hived out from the expressions of thoughts and experiences of the participants. Codes were further broken down into sub-themes. Findings were presented in prose and formed the basis for generating the discussion and recommendations.

Ethical considerations

Ethical approval was obtained from the Research ethics committee of ISTH. Participants were informed that the sessions were to be recorded and played back for transcribing and assured of the confidentiality of information provided. All participants were made to sign an informed consent form prior to the start of each session.

RESULTS

Background information on respondents

In all, 48 family caregivers participated in the FGDs. Twenty-four (50.0%) of the respondents were in the 26 to 45 years age bracket, 18 (37.5%) were aged ≥ 45 years, and 6 (12.5%) were ≤ 25 years. The distribution of respondents saw more females, 36 (75.0%) than males 12 (25.0%). Two (4.6%) respondents had no formal education, 31 (64.6%) had primary or secondary level, 15 (31.3%) had tertiary level of education. Twenty-six (54.2%) were of Esan origin, 18 (37.5%) were Estako speaking and 4 (8.3%) were from other tribes. Thirty (62.5%) respondents were Christians and 18 (37.5%) Moslems (Table 1).

Participants were open and actively engaged as sessions were viewed as an opportunity to actively express themselves on a topic they saw as important to their well-being and that of their patients.

Respondents' awareness of Lassa fever prior to illness encounter

Participants were questioned on their general knowledge of Lassa fever including the vector, mode of transmission and prevention. Almost all respondents had previously heard of Lassa fever from several sources including health workers, school, colleagues, and the media. Two (5.2%) respondents claimed they only knew of the disease when their relatives fell victims (Table 2). One, a 41-years-old male participant only heard of Lassa fever after his brother who had fever and was admitted in a private clinic failed to respond to anti-malarial and Augmentin treatment. He remarked; "For a while the doctor thought we were dealing with fake drugs. Eventually he sent my brother's blood to Otiabor and the result was Lassa fever". The second claimed she had never heard of Lassa fever as she lived in Abuja and was spending her annual leave with her mother when the illness began. Four (10.5%) participants described the multimammate rodent vector correctly as the 'rat with multiple breasts'. A 36-years-old male respondent gave the local name for the rodent as 'Ukhainle' implying 'a rat

Table 1. Sociodemographic characteristics of respondents (n = 48).

Parameter	Frequency (%)
Sex	
Male	12 (25.0)
Female	26 (75.0)
Religion	
Christian	30 (62.5)
Moslem	18 (37.5)
Marital status	
Single	13 (27.1)
Married	34 (70.8)
Widowed	1 (2.1)
Educational level	
No formal education	2 (4.6)
Primary/Secondary	31 (64.6)
Tertiary	15 (31.3)
Tribe	
Esan	26 (54.2)
Estako	18 (37.5)
Others	4 (8.3)

with a bad smell'.

Majority mentioned unsanitary environments, spreading food to sun-dry on the ground, bush burning and leaving raw food uncovered as risk factors for infection.

Most respondents had seen a rat in their house since the year started. Preventive measures mentioned included storing food in covered containers and avoidance of the consumption of garri soaked in water. Most respondents claimed they washed plates and utensils to store away till further use, however the majority admitted they never rinsed stored plates before use, as they assumed the plate was still clean. Majority agreed that cultural practices like sun drying food by the side of tarred roads should be stopped, and some argued for the return of sanitary inspectors to check and enforce sanitation around homes.

Despite this seemingly high level of awareness, a few participants were still of the view that some 'spiritual force' was still involved. According to a 31-year-old mother; *"I still think somebody is responsible for my child's illness, not just a rat"*. A 45-year-old female participant said, *"This my child's illness is caused by witchcraft, as right from childhood we have been eating rat and have not come down with such an illness"*.

Reaction to the news of Lassa fever positive test result and support received

Participants reported varied responses to a positive test result. Denial, panic, anxiety and fear were common emotions mentioned (Table 2). Common responses in denial of the result were: *"God forbid"*, *"it's not my portion"*, *"It is not possible"*, *"How come?"*. A few participants wanted the test repeated out of disbelief. A 30-year-old female said: *"When the laboratory called me and told me the result, I was seriously afraid and in fact I started crying and asked God why me?"*.

A few expressed anger and initially wanted the test to be re-run to confirm the diagnosis. This was vividly expressed by a 39-year old female participant who said *"I was angry at the initial results from the laboratory, because of the seriousness of the disease, I even suspected they had made a mistake in the result. The disease is a serious one"*.

A male participant whose relation's blood sample first came out as negative, and returned positive after a re-run said: *"I was happy when the first result came out negative, because I used to hear of one of our village men who died of that disease. But when they called me to say it"*

was positive, I was angry, but what can I do? I eventually had to accept it and hope for the best”.

Some participant however expressed optimism. A 28-year-old female participant said: “As for me, I was not scared when I was told my mother had Lassa fever, in fact I thanked God that the illness can be diagnosed here in the state. I just believed it will be well”. This view was shared by a male respondent whose wife was treated for 4 days without remission of symptoms prior to the confirmation of her illness as Lassa fever. In his words: “I was not afraid since at least now we know what is wrong with her”. A few participants who did not experience any emotional change mentioned they knew someone who had been ill with Lassa fever and survived.

For many participants, these initial reactions eventually transitioned to acceptance of the result and accompaniment of the confirmed case to the isolation ward of the treatment facility. Many participants expressed disappointment over the fact that they were not provided information ahead of the result that would prepare them emotionally and psychologically to receive the news, nor were they told what to expect in the coming days, including the purpose for isolating their loved ones. Some respondents however explained that when they confronted their doctors for further information about what next was to be done, they were satisfied with the information given.

Caregiver’s willingness to disclose nature of relative’s illness

The willingness to disclose the nature of disease affecting a loved one can be regarded as a reflection of self-stigma. Self-stigma occurs when people affected by a condition internalize negative public prejudices, stereotypes and attitudes toward them, and as a result experience unpleasant consequence within themselves (Maharjan and Panthee, 2019). Some respondents expressed they were afraid to tell other family members, particularly distant relatives and friends, about the confirmation of Lassa fever in their patient to avoid stigmatization. They feared they may be seen as people with poor environmental sanitation practices who harbour rodents in their houses and may transmit disease. A 36-year-old female participant’s response was: “I chose to hide my brother’s illness because am afraid of the way that neighbours will look at him when he recovers and comes home.”

A 49-year-old female respondent cited an instance when a patient’s stepfather refused to visit the patient from the time he learnt the ailment was Lassa fever. She concluded that the stepfather was either ashamed of the illness or afraid that he might become infected.

A 54-year-old woman said: “since the time my husband’s people knew he has Lassa fever; they have refused to visit us here. Even when I tell them I give them hand glove and nose mask; they will say no we don’t

want to catch Lassa fever”

In contrast, the response from other participants was that they were not opposed to telling other people the nature of illness affecting their patient. In this group, those who had told others claimed the response they received was generally one of sympathy and best wishes for the sick. Other respondents had to inform relatives to obtain financial assistance. Four respondents needed to inform their employers for permission to take time off work to attend to their patient. They however expressed no fear of losing their jobs from stigmatization. Generally, family members were more likely to be informed of patients’ ill health than friends. Interestingly, one participant said his relatives responded promptly and positively when they heard of the problem (Table 2).

Perceived stigmatization from health workers

A common thread running through all the FGDs particularly from those whose patients were referred from private and public health facilities in neighbouring local government areas and other states was that the care given by health workers to their patients changed dramatically when the Lassa fever confirmatory test result returned positive (Table 2). Such participants reported their relatives were almost abandoned or discriminated against by attending health workers for fear they may contract the disease, leaving caregivers to provide bedside care. During such times, they described the behaviour of the health workers as uncaring and unfriendly. They also felt aggrieved when health workers wore nose masks and hand gloves to attend to their patient, and they were neither given one, nor provided a reason for wearing personal protective gear. As a 47-year-old mother put it: “Imagine the doctor asked for nose mask to attend to my child. What about us his relatives?” As another respondent put it: “The nurses would probably have taken care of my brother if he did not have Lassa fever”.

In the words of a 27-year old female respondent: “I think the nurses and orderlies should have done more of the work as they are trained, and not left it to us. Who are we to complain to?”

A 41-year old female respondent said: “I and the driver that brought me had to carry my husband from the ward to the car. None of the staff there were willing to help me. Can you imagine that?”

Respondents whose relatives were referred from health facilities within close vicinity of the hospital reported less discrimination. An interesting finding was that a few respondents experienced some form of stigmatization from health workers at the emergency unit of the referral hospital, before the patient was transferred to the Lassa fever isolation ward of the treatment centre. Majority of the caregivers were satisfied with the psychological support given to them and their patients by staff in the Lassa fever isolation ward, as the staff were always

Table 2. Respondents perception of stigma (N = 48).

Thematic questions	Responses		
	Yes	No	Total
Awareness of Lassa fever	46 (95.7)	2 (4.2)	48 (100.0)
Experienced emotional change after news of a positive test result	23 (47.9)	25 (52.1)	48 (100.0)
Willingness to disclose illness to family	18 (37.5)	30 (62.5)	48 (100.0)
Willingness to disclose illness to friends	12 (25.0)	36 (75.0)	48 (100.0)
Perceived stigmatization in the community	13 (27.1)	35 (72.9)	48 (100.0)
Perceived stigmatization from non-Lassa fever isolation ward health worker	29 (60.4)	19 (39.6)	48 (100.0)

encouraging them to be optimistic about recovery and kind towards their plight. They also expressed that they were never stigmatized in the Lassa fever isolation ward. They however all expressed that they would have expected to see more of the presence of the nurses attending to their relatives.

Fear of stigmatization from the community

Respondents were generally divided as to whether Lassa fever is still stigmatized in the community or not, with about 13 (27.1%) of the opinion that the disease was stigmatized (Table 2). Those who felt there was no stigma believed awareness of Lassa fever had increased with the sensitization organized by government. Some others opined that Lassa fever was just like any other sickness and could affect anyone. In the words of a 54-year-old woman: *“Let them laugh if they want to, nobody knows who will get Lassa tomorrow”*. One reason given to support the opinion that Lassa fever was not stigmatized was that they knew of persons who had recovered from Lassa fever and were living peacefully in their communities. Mention was also made of the fact that contact tracing teams from the local government public health department were well received at the homes of confirmed cases when they visited to line list and follow-up contacts.

Other respondents however maintained that Lassa fever still carried stigma in the community. A male participant said he planned to relocate his family to a new apartment when his patient was discharged because he feared what his neighbours will say. One respondent cited the instance of someone she knew who was sacked from work because she was admitted in the isolation ward for Lassa fever treatment.

Perceived stressors during the admission period and sources of psychological support for caregiver

Participants were asked about their emotional state and coping techniques while their loved ones were on admission. Some respondents shared that they were

under varying levels of emotional stress borne out of the fact that they were not allowed to see their patients as often as they would have loved to due to the isolation and restricted entry protocol in place in the Lassa fever treatment centre. Some respondents expressed their worry that clinical staff of the isolation ward were not always in the ward to attend to the needs of their patients. A 24 years old female participant said: *“My mum has not been sleeping well because my brother is restless at night, and there is no nurse to monitor him.”*

The lack of accommodation for caregivers, particularly those who came from distant locations, was also a source of stress as they were exposed to wind, rain, and mosquitoes at night in make-shift shelters around the isolation ward. Three respondents who had vehicles said they slept in their cars.

Respondents claimed their source of emotional succour came from their religious belief that God will heal their loved ones. A 36-year-old female participant said: *“When we were admitted, I had to call my pastor and tell my prayer group. I also sent prayer requests to several prayer meetings”*. A few others claimed they were encouraged by stories of recovery they heard from survivors who they met in the ward and those in the communities. A 45-year-old female participant said: *“One patient told me to calm down, that in a few days my son will be better. That helped me a lot”*. Majority expressed satisfaction with the quality of treatment given to their relatives as evidenced by the marked improvement in symptoms since they came to the treatment centre. This was another source of emotional support to them, as they felt hopefully and reassured with the mindset that staff on ground were competent.

DISCUSSION

The study set out to understand the psychological state of family caregivers of Lassa fever patients with a goal to identify areas where psychosocial support would be beneficial. The high level of awareness of Lassa fever among participants reflects the success of public health education campaigns and sensitization programs organized by the state and local government authorities,

WHO, NCDC and ISTH over the years. However, the gaps in knowledge and poor practices that increased individual risk of infection were evident, as some respondents were ignorant of or held misconceptions about the cause of the disease and rodent vector, and some food hygiene practices were poor. These gaps in knowledge and preventive health behaviour should be addressed in future public health enlightenment programs on Lassa fever, especially the washing of eating utensils before use.

Despite the good level of awareness, the initial emotional reactions expressed by some participants on reception of the news of disease shows that some level of fear and dread of the disease still exists in the community. Similar reactions have been documented from studies on other highly infectious diseases (Bali et al., 2016; Van Bortel et al., 2016). This finding highlights the need for emphasis on risk communication to allay the fears of the public and clear misconceptions. Media reports of an outbreak have the capacity to fuel public anxiety out of proportion to the reality of the actual threat of an infectious disease to health especially when official information is either absent or considered untrustworthy (Person et al., 2004). Even in instances where official information is communicated promptly, competition among media houses to gain news popularity and report new developments may lead to an exaggeration of the outbreak, fuel public fears (World Health Organization, 2005). Public health authorities should work with media houses to ensure that messaging on Lassa fever is delivered in such a manner that transfers accurate and concise information with emphasis on allaying fears. It may also be necessary to monitor the content of media reports aired during outbreaks of Lassa fever to ensure that messages do not create panic.

The manner in which laboratory test results are communicated to patients and their caregivers influences the way the result is accepted by the receiver and may contribute to the initial reactions they experience (Monsonogo et al., 2011; World Health Organization, 2005). Pre-test counselling at the time when a request for a Lassa fever test is made, and post-test counselling when a result is relayed to the patient, particularly if it is a positive result should be built into guidelines for management of Lassa fever and other viral haemorrhagic fevers.

People affected or infected with a disease would seek more information about the disease from credible sources such as a health provider, and would want to participate in decision making regarding their care (Sengupta et al., 2011). Where the opportunity for such an interaction is non-existent, anxiety, panic and fear set in. Caregivers who perceive a better understanding of a disease are on the other hand less anxious. Health providers should ensure caregivers are provided sufficient information to clear any doubt.

The existence of social stigmatization towards Lassa fever victims was expressed by some participants. Stigma

has also been reported in other infectious disease outbreaks (Pappas et al., 2009; Sengupta et al., 2011). Self-stigmatization is reflected in the unwillingness of some participants to inform other persons about their sick patients and has been documented in previous studies (Sengupta et al., 2011). Self-stigma prevents the family caregiver from assessing the financial, material and other resources that would otherwise be available through a wider network of friends, relatives and social groups (Barrett and Brown, 2008; Fischer et al., 2019). Self-stigma needs to be addressed by intensified community sensitization during outbreaks to correct erroneous beliefs about the transmission, and provision of counselling services and psychosocial support to caregivers.

Patients and family caregivers who fear social stigmatization may be unwilling to provide correct information to contact tracing teams to prevent them from visiting their homes. This was observed during the Ebola outbreak in Sierra Leone (Olu et al., 2016). Home visits by contact tracers also have the potential to create tension among neighbours of affected households. Appropriate community messaging on Lassa fever will also help to maintain the balance between the need to implement public health control measures that include exclusionary practices and treatments and a community understands of transmission risk. As was mentioned during the interview, there are reports of people who lost their jobs because they were patients, and were not reinstated until government authorities intervened (Pai, 2019).

Some respondents attested to the marginalization of their patients by health workers in referring health facilities and in the emergency department of ISTH prior to admission in the Lassa fever isolation and treatment centre. This may not be unrelated to the health care workers' fears of contracting the disease, fear that is amplified by poor understanding of the disease, stories of deaths in health workers from nosocomial infection with Lassa fever during previous outbreaks and the non-availability of personal protective equipment, a perineal problem in public hospitals (Idigbe et al., 2019).

Respondents were generally satisfied with the empathy received from Isolation ward staff. However, the concerns about the less than optimal care provided to their loved ones expressed by some respondents merits attention, as similar findings have been documented in studies that examine the effect of isolation precautions on patients and their family caregivers (Abad et al., 2010). Isolation protocol adds emotional stress to family caregivers (Radtke et al., 2019). It is important that health providers in treatment centres make efforts to mitigate the negative effects of isolation on caregivers by providing patient and family-centred care, while protecting the caregiver from contracting the disease. Identification of a dedicated caregiver, training on infection prevention and control and allowing for timed visits to in-patients may help the caregiver appreciate the peculiarities of

case management in an isolation centre and relieve some anxiety. Pre-admission protocols should include counselling to family caregivers. Lassa fever survivors can be called upon to assist with psychological support to caregivers as the study showed some respondents found this action useful.

Strengths and limitations

The study's limitations and strengths are common to qualitative studies. The low number of respondents may not capture the broader range of views of Lassa caregivers especially from other parts of the country. The interactive nature of the study is a strength as it enabled a broad range of ideas on psychosocial experiences of family caregivers to be explored than would have been possible if another methodology was used for data collection.

Conclusion

Lassa fever continues to exert reasonable psychological strain on family caregivers brought on by real or perceived self and society stigma. Health workers should ensure appropriate counselling of confirmed cases and their families at the times of breaking the news of a Lassa positive test result. Appropriate and sustained community messaging on Lassa fever will help to reduce stigmatization. Stigmatization of Lassa fever patients by healthcare providers in non-Lassa fever treatment facilities should be discouraged. Rather, health providers should be given the necessary training and commodities to build their confidence to support suspected or confirmed cases to referral centres where specific care will be provided. Survivors may be called upon to support psychological services and counselling to patients and family caregivers

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

The authors appreciate the caregivers who participated in this study. The authors are also grateful to the Matron Rebecca Atafo, Rita Esumeh, Benevolence Eboh, Racheal Ominu and Rosemary Giwa who assisted with the conduct of the FGD.

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Full Length Research Paper

Influence of family violence on the maladaptive behaviors of secondary school students in Kogi State, Nigeria

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Received 23 September, 2020; Accepted 29 October, 2020

This study explored the influence of family violence on the Maladaptive Behaviours of Secondary School Students in Kogi State, Nigeria. The design for this study is correlational research design. The population of the study consists of 29,570 students in secondary schools in Kogi State, Nigeria. A sample of 378 respondents was selected for this study. Stratified random sampling procedure was used in selecting the students. The instrument for data collection was the family violence and characteristics of Maladaptive Behaviour Questionnaire (FVMBQ). The FVMBQ is a 24-item instrument designed along a modified four-point Likert scale. The questionnaire was validated by a team of experts in the Faculty of Education, University of Abuja. The reliability of the instrument was established via a pilot test conducted using the test-retest method of reliability, which yielded the reliability (r) value of 0.86. The data collected was analyzed using mean, standard deviation and linear regression. The study found incidences of family violence and maladaptive behaviour and also revealed that family violence significantly predicts maladaptive behaviour of secondary school students in Kogi State. It was recommended among others that parents must develop the right attitude of love, trust, tolerance and patience towards their children; parents need to step in before sibling rivalry turns into abuse and teachers should provide a caring, compassionate, supportive environment for the school child to rebuild trust that has probably been destroyed by an abuser at home.

Key words: Adolescents, family violence, maladaptive behavior, students.

INTRODUCTION

Violence within a family has received an increasing amount of attention from the media in recent years. It has become an issue of global concern. Hillis et al. (2016) stated that it is globally estimated that up to 1 billion children aged 2-17 years have experienced physical,

sexual, or emotional violence or neglect in the past year. This shows that family violence is not a rare phenomenon. All families do have conflicts but some families may occasionally resolve these conflicts inappropriately. Even the best parents and the most

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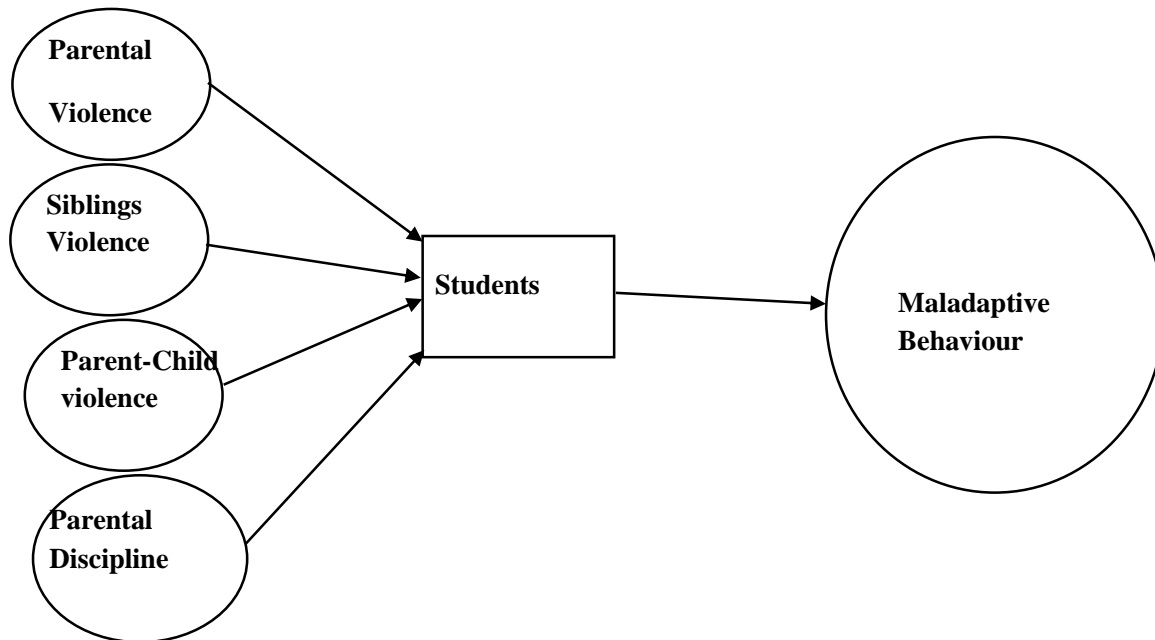


Figure 1. Family violence-maladaptive behavior framework.

loving couples do display inappropriate behavior. They sometimes lose their tempers, say intentionally hurtful things to one another, raise their voices when arguing, and even lash out physically. In many respects, aggression is common and could culturally be approved as part of family life.

Family violence is a problem that involves father, mother, children, elderly or sibling in any family relationship. Global reports on the problem reveal that the main victims and vulnerable group of family violence are women and children. In the past, most of the focus was on the grave harm that family violence cause to the battered woman and very little attention is made on the harm suffered by millions of children who witness it. However, in the twentieth century there is a growing concern on how exposure to violence in the family impacts or influences children.

Central to many behaviorists' studies according to Bandura in Fryling et al. (2011) have given the concepts of social learning by modeling. It suggests that violent behavior is learned in interaction with others, especially intimate individuals who assault their spouses, carry out patterns of behavior learned in childhood from other violent models. In other words, violence is learned through role models provided by the family (parents, siblings, relatives, and boyfriends/girlfriends), either directly or indirectly (that is, witnessing violence) reinforced in childhood and continues in adulthood (Bandura in Fryling et al. 2011). When children witness violent behavior in the home they are learning more than it's acceptable. Children that live in homes with repeat violence will act out by hitting, biting, and pushing friends,

siblings, and classmates. The family environment is the pedestal on which every society is built therefore it is foundational to the stability or instability of the society.

Family violence as it affects its victims could take different forms. Communities and Justice (2019) identified the following five forms of violence experienced within the home as; physical abuse, psychological abuse, emotional abuse, sexual abuse, religious abuse, image-based abuse, reproductive abuse and financial abuse. Throughout childhood, children and adolescents experience patterns of assault that adults do not, such as sibling assault. Källström et al. (2020) found differential patterns of abuse based on the perpetrator; parents were most likely to use physical aggression, whereas siblings typically perpetrated property crimes and partners committed sexual assault. Peers were the most likely perpetrator of both physical and verbal victimizations and also most often committed poly-victimization by subjecting youth to multiple forms of violence. While males were more likely to be victimized by peers, females were more likely to be victimized by parents, siblings, and partners. These events are rarely studied, but they should be because so many children experience them and reports fears about them.

Conceptual framework

Family violence is conceptualized in this study as violence between parents, violence between siblings, violence between parents and the child as well as negative parental disciplinary actions. Figure 1 depicts

the relationship between family violence and maladaptive behavior. Previous studies have investigated marital violence, single parenthood (Animasahun, 2014) or broken home (Aboh et al., 2014) as independent variables, while either antisocial behavior, psychological functioning or maladaptive behavior were considered as dependent variables respectively, none examined the influence of patterns of family violence as independent variable and maladaptive behaviors of student dependent variable. It is against this backdrop that this researcher intends to investigate the influence of family violence on the maladaptive behavior of secondary school students in Kogi State.

Theoretical framework

The social learning theory of Bandura emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others. Bandura (1977) states: "Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action" (p 22). Social learning theory explains human behavior in terms of continuous reciprocal interaction between cognitive, behavioral, an environmental influence. The component processes underlying observational learning are: (1) Attention, including modeled events (distinctiveness, affective valence, complexity, prevalence, functional value) and observer characteristics (sensory capacities, arousal level, perceptual set, past reinforcement); (2) Retention, including symbolic coding, cognitive organization, symbolic rehearsal, motor rehearsal); (3) Motor Reproduction, including physical capabilities, self-observation of reproduction, accuracy of feedback; and (4) Motivation, including external, vicarious and self-reinforcement.

In Bandura's famous Baby doll experiment, he demonstrated that children learn and imitate behaviors they have observed in other people. The children in Bandura's studies observed an adult acting violently toward a baby doll. When the children were later allowed to play in a room with the baby doll, they began to imitate the aggressive actions they had previously observed.

Social learning theory as applied to family violence suggests that violent behavior is learned during interaction with others, especially intimate individuals who assault their spouses, carry out patterns of behavior learned in childhood from other violent models. Violence can be learned through role models provided by the family (parents, siblings, relatives, and boyfriends/girlfriends), either directly or indirectly (that is,

witnessing violence) reinforced in childhood and continues in adulthood. The social learning theory therefore stipulates that maladaptive behavior results from interaction of couples as well as the influence of significant others in their life. Their actions or activities are product of their interaction with the environment as well as the behavior of the individuals/ couples. The actions of members of the family according to the theory results from interaction of couples with the significant others in their life. The theory emphasizes imitation as a major means of learning and when one of them exhibits such learnt negative behavior there is every tendency that it might not be accepted by the other, this will result in maladaptive behavior.

Statement of the problem

A major concern in Kogi State and in many other communities today is the increased disobedience of students to school authorities, students' refusal to go to school, students refusing to do tasks assigned by teachers, indecent dressing, aggression towards teachers and peers, truancy and unnecessary disruptions during classes. Painfully, students indulge more in examination malpractices ranging from cheating, leakage of papers, and external unauthorized persons to copying from handset. The prevalence of these behaviors could constitute great threat to the peace and stability of the school and the future society at large since such behaviors go against the norms and values of our society.

Many have attributed these behaviors to lack of adequate teaching facilities and unqualified teachers, without actually finding out what other related factors could be contributing to student's poor performance in school. The society is quick in pointing accusing fingers at teachers forgetting that the time spent by these students in school is only about 25% of 24 h that make up a day. Obviously the remaining 75% is spent outside the school environment which could be at home. The foundation of every child's development and socialization is laid at home because children spend more time at home than in school.

With the foregoing, one is forced to ask, what factors in the home could be influencing the maladaptive behaviors of secondary school students. Researches, have found many factors that could influence how well a student behaves in school and the amount of self-confidence. The experience from the family is a factor that could possibly affect student's maladaptive behaviors. In line with this assertion is Durojaiye (2003) as cited in Aboh et al. (2014), who argued that maladaptive behavior is believed to result from under socialization and inadequate training of children which make them to proffer reasons for indulging in unacceptable behaviors.

In view of the observed low level of awareness in the

study area of the extent to which exposure to family violence disrupts a child's behavior at school, the researchers were motivated to carry out this study. This study therefore investigated how exposure to family violence can influence the behavior of adolescents by predisposing them to maladaptive behavior. The following research questions were raised to guide the research:

1. What is the pattern of family violence among secondary school students in Kogi State?
2. What maladaptive behaviors are exhibited by secondary school secondary school students in Kogi State?
3. To what extent do family violence influence maladaptive behaviors of secondary school students in Kogi State?

The study hypothesized that there is no significant relationship between family violence and maladaptive behaviors of secondary school students in Kogi State.

METHODOLOGY

The research design adopted for this study is descriptive survey. A descriptive survey attempts to establish the range and distribution of some characteristics, in this case family violence and to discover how these characteristics may be related to maladaptive behavior of students. The population of the study consists of 29,570 senior secondary school students in Kogi State registered as at 2016/2017 academic session. A sample of 378 respondents was selected for this study. Stratified random sampling procedure was used in selecting the students from the different Government-owned Secondary schools so as to cut relatively across the population. This sample was considered appropriate for an approximate population of 29,570 using the table provided by Krejcie and Morgan (1970) for determining sample size from a given population. Stratified random sampling technique was implemented by subdividing the entire population into three strata on the basis of three educational zones (Kogi Central, Kogi East and Kogi West). A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. These subsets of the strata are then pooled to form a random sample of senior secondary students from the different secondary schools.

The instrument for data collection was entitled: Family Violence and Characteristics of Maladaptive Behavior Questionnaire (FVMBQ). The FVMBQ was a 24-item instrument designed along a modified four-point Likert scale. The questionnaire was validated (face, content and construct validity) by a team of experts in the Faculty of Education, University of Abuja. During this process, items that were considered to be vague, ambiguous or irrelevant were removed to ensure that the questionnaire serve the purpose for which it was designed. In order to establish the reliability of the instrument, a pilot test was conducted. Using the test-retest method of reliability, the two set of scores obtained from the pilot test were correlated using Pearson Product Moment Correlation (PPMC). The reliability (r) value of 0.86 was obtained for the scores which implied a high reliability of the instrument. To collect the data required for the study, the researchers collected a letter of introduction from the authorities in the Department of Counseling and Educational Psychology, University of Abuja, Abuja, Nigeria to the principals of various schools. The letter explained the purpose of the study and sought the consent of the participants. They were assured of

confidentiality of the information provided. Consent was granted before the researchers proceeded to administer the questionnaire.

The statistical tools that were used in analyzing the collected data include mean, standard deviation and Linear Regression. To answer the research questions, the researchers adopted a decision rule based on the midpoint of 2.50. This is because the research instrument was created on a 4-point Likert scale with options/score as Strongly Agree/4 points, Agree/3 points, Disagree/2 points and Strongly Disagree/1 point. The sum of $4+3+2+1=10/4=2.50$. Items whose mean scores were equal to/ above 2.50 were considered as agreed while items with mean scores below 2.50 were considered as disagree.

Linear regression was used as a linear approach to modeling the relationship between maladaptive behavior (dependent variable) and one explanatory independent variable (family violence). Usually, linear regression applies in the case of one explanatory variable. To achieve the goal of prediction, linear regression was used to fit a predictive model to the observed data set of values of maladaptive behavior and family violence (dependent and independent variables respectively). For the purpose of explaining variation in maladaptive behavior that can be attributed to variation in family violence, linear regression analysis was also applied to quantify the strength of the relationship between the two variables.

RESULTS

Research Question One: What is the pattern of family violence among secondary school students in Kogi State?

Table 1 presents data with respect to the pattern of family violence among secondary school students in Kogi State. The study identified the pattern of family violence such as siblings' assault, parent-child abuse and spouse battery. The analysis shows disagreement with the items on patterns of family violence in the study population. The sectional mean of 1.87 (below the midpoint of 2.5) indicates low incidence although all types of family violence were identified in the study area. This implies that the incidence of family violence occurs but relatively low in the study area.

Research Question Two: What maladaptive behaviors are exhibited by secondary school students in Kogi State?

Table 2 presents data with respect to the maladaptive behaviors exhibited by secondary school students in Kogi State. The analysis shows disagreement with the items on maladaptive behaviors in the study population. The sectional mean of 2.05 (below the midpoint of 2.5), implies low incidence although different maladaptive behaviors were identified among secondary school students in the study population. This implies that the maladaptive behavior was found among students but was not widespread. This finding may be due to lack of willingness of participants to divulge personal information about family and self especially when portrayed negatively. So, mild reporting of the incidences of family violence and maladaptive behavior might have occurred. Nonetheless, both variables were found to occur in the study area.

Ho₁: There is no significant relationship between family

Table 1. Pattern of family violence among secondary school students.

S/N	Statement	Mean	Std. Dev.
1	My parents do have serious quarrels	1.65	0.95
2	When my parents quarrel, they end up fighting each other	1.7	0.92
3	When my parents quarrel, they keep malice with each other and I don't like it	1.2	1.03
4	I often receive physical beating from my father	2.09	0.94
5	I often receive physical beating from my mother	1.78	0.95
6	My parents frequently punish me by denying me food.	1.53	0.81
7	My parents punish me by locking me outside over the night	1.94	1.04
8	As a male/female there is too much parental expectation from me	2.43	1.05
9	My sibling(s) and I often quarrel	2.31	1.08
10	When my sibling(s) and I quarrel, we end up fighting	2.05	1.1
	Sectional Mean	1.87	

N=379.

Table 2. Maladaptive behavior of secondary school students.

S/N	Statement	Mean	Std. Dev.
1	I have difficulty maintaining good relationship with my peers	2.02	1.04
2	I lack good talking relationship with my teachers and peer	2.26	1.05
3	I experience fear, shock and nervousness, like something bad wants to take place I often withdraw from people to be alone	2.29	1.01
4	I am often unhappy even when others around me are happy	1.95	0.96
5	I easily feel pain, tired, weak and depressed	2.1	0.99
6	I over react to issues negatively	1.99	0.96
7	I do get aggressive towards people and things around me	2.01	0.93
8	I depend on my friends to assist me do my school work	1.81	0.92
9	My grades in school have not been very good	2.01	1.09
10	Sectional Mean	2.04	1.1
		2.05	

N=379.

violence and maladaptive behavior of secondary school students in Kogi State.

Linear Regression was used to carry out this test and the result is presented on Table 3. The R value, correlation coefficient is a measure of the quality of the prediction of the dependent variable. An R- value of 0.641 indicates relatively high level of prediction. The R Square called the coefficient of determination shows the proportion of variance in the dependent variable that can be explained by the independent variable. The R square value of .410 indicates that 41% of the variability of the dependent variable (maladaptive behavior) can be explained on the basis of the family violence experienced. This implies that students' who experienced family violence stood a chance (41%) of exhibiting maladaptive behavior.

To determine the statistical significance of predictability of students' maladaptive behavior by family violence

experienced, analysis was carried out and results as presented on Table 4. Table 4 shows whether the independent variables significantly predict the dependent variable. A significant value of .000 (less than the 0.05 level of significance) shows that the independent variables significantly predict the dependent variable. The hypothesis is therefore rejected. This implies that family violence significantly predicts maladaptive behavior of secondary school students in Kogi State. Thus, the hypothesis is therefore rejected.

DISCUSSION

The first finding in this study on the pattern of family violence reveals parent verbal abuse, spouse battery, parent physical abuse (father and mother), child neglect, parents' high expectation from children (parents emotional

Table 3. Model summary for test of predictability of maladaptive behaviors by family violence.

Model	R	R Square	Adjusted R square	Std. error of the estimate
1	0.641	0.410	0.409	0.48945

Table 4. ANOVA table for test of predictability of students' maladaptive behavior by family violence.

Model	Sum of squares	df	Mean square	F	Sig.	Decision
Regression	60.047	1	60.047			
Residual	86.263	377	0.252	238.064	0	Rejected
Total	146.311	378				

a. Predictor: (Constant), Family Violence. b. Dependent Variable: Maladaptive Behavior.

abuse), sibling rivalry and sibling assault in the study area in varying extents. The analysis made from the responses of students showed "parental high expectation from children" to be the most common with mean of 2.43 followed by sibling assault (2.31), closely followed is physical assault by father 2.09, while parents keeping malice from each other had the smallest mean of 1.20. Other facts reported on patterns of family violence were sibling rivalry and assault. From the findings of this study, sibling rivalry is a very common pattern of family violence. In general, though, low prevalence of family violence was reported. This result supports the findings of Boyse (2012) who affirmed that violence between siblings is quite common and probably even more common than parent child abuse or spouse abuse. Turner et al. (2010) in their study reported that exposure to multiple forms of victimization was common. They also found that almost 66% of the sample was exposed to more than one type of victimization, 30% experienced five or more types, and 10% experienced 11 or more different forms of victimization in their lifetimes. It was also noted in many cases, that sibling abuse occur as "second hand abuse" in which children who have been harmed or maltreated by parents go on to harm siblings (Boyse, 2012). Siblings naturally have squabbles and class with each other. However, if one child is always the victim and the other child is always the aggressor, it becomes an abusive situation. This study believes that behaviors among siblings that cross the line into abuse deserve more recognition.

With regards to types of maladaptive behavior, the most prevalent in the study area are; experiences of fear, shock and nervousness (anxiety) and students' lack of good relations with teachers and peers (poor interpersonal skills/low social competencies). This was followed by feeling unhappy irrespective of the happy mood of others around (low self-esteem). This result is consistent with the assertion of Iwuoma in Kwaja and Mormah (2008) who identified eight variables that characterizes an individuals' maladaptive behavior namely,

inability to build or maintain satisfactory relationship with peers and teachers, generally moody or unhappy in situations where other children express excitement and happiness, truancy, exhibition of inappropriate behavior under normal conditions, overdependence on teachers and peers, anxiety, task avoidance and negative over reaction.

It is important to point out that the various forms of family violence and maladaptive behavior were found to be of low prevalence in the present study. However, since there is ample indication of family violence and maladaptive behavior, the study further sought to establish the predictability of maladaptive behavior on the basis of children exposure to family violence. The null hypothesis which states that: there is no significant relationship between family violence and maladaptive behavior of secondary school students was rejected. The test of predictability reveals that family violence significantly predicts maladaptive behavior of students. This result agrees with the research findings of Animasahun (2014) which affirmed that adolescents of conflict-oriented families were more than twice as likely as other adolescents to engage in antisocial behaviors due to the disharmony between the father and mother (spouse battery). Al-Odhayani et al. (2013) had also stated that child abuse is a common problem worldwide and its physical and psychosocial effects are felt by abused children, their families, and their communities. It has been linked to changes in the victims' mental and behavioral development throughout their lives, putting them at risk of engaging in potentially dangerous behavior in the future.

CONCLUSION AND RECOMMENDATIONS

The study concludes that there is low prevalence of patterns of family violence in Kogi State, although various patterns of family violence such as parent-child abuse, sibling assault and spouse battery still exist in the study area. The study established also that maladaptive

behaviors exhibited among secondary school students in Kogi State is of low incidence although maladaptive behaviors were identified among students in the study area. Family violence was also found to significantly predict maladaptive behavior of secondary school students in Kogi State. This study has thus established that even the least levels of family violence may predispose students to indulging in maladaptive behavior (a socially acquired behavior).

Although, low levels of family violence and maladaptive behavior were reported in this study, it was shown that students who experience family violence may also unwittingly be disposed to exhibiting behavior that is maladaptive. Apparently, even low incidence of family violence can negatively impact on adolescent behavior. This finding benefits a number of stakeholders, namely teachers, students, counselors and parents. The study benefits the teachers as it exposed them to the fact that the maladaptive behavior of a student may be connected to violence in the home thereby helping teachers plan efficient strategies that could assist students overcome traumatic experiences. School counselors are also enabled to plan appropriate counseling strategies that involves partnership with students and their parents in addressing maladaptive behavior. The study provided necessary information that could help parents to modify the approach they employ in resolving disagreements between themselves and among siblings so as to provide opportunity for modeling acceptable behaviors. In view of the findings in this study, the following recommendations are made:

- (1) Parents must develop the right attitude of love, trust, tolerance and patience towards their adolescent children instead of scolding, shouting and judging them.
- 2) Forum should be created whereby administrators could give enlightenment talks on family violence, emphasizing its behavioral, psychological, emotional and academic consequences and the need for families to avoid it for a better society.
- 3) In view of the significant prediction between the two variables, it is important for administrators, teachers and the school counselor to provide and promote a caring, compassionate, supportive environment for the school child to rebuild trust that has probably been destroyed by an abuser at home.
- 4) Teachers, school counselors and other stakeholders are required to legally report suspected and eye witnessed abuse to the law enforcement agencies.
- 5) Civic and religious organizations are also required to promote proper dispute resolution mechanisms in the family; they are expected to encourage parents to imbibe positively-oriented disciplinary approaches for behavior modification of their wards.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Validation of the attitude towards sexuality scale in two samples of university students

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Received 28 September, 2020; Accepted 22 October, 2020

There exists a scale, developed in Mexico, aimed to measure attitude towards sexuality. Good metric properties have been reported for this scale, but there have been no studies aimed at corroborating those observations. This study aims to verify the validity, as well as the invariance between two samples, of the three-factor model originally proposed for the scale, to estimate its internal consistency reliability, to describe its distribution, and to verify its concurrent validity in relation to the attitude towards homosexuality. Two incidental samples of 402 psychology students and 198 medical students were recruited. The Attitude towards Sexuality Scale (ASS-20) was applied to both samples. Likewise, the attitude towards homosexuality scale was also applied to the psychology students, whereas the factor of subtle rejection towards gay men, taken from the Mexican adaptation of Herek's Attitude towards Lesbians and Gay Men Scale, was applied to medical students. Single-factor, correlated-factor, hierarchical, and bifactor models were tested. Multigroup confirmatory factor analysis revealed that the correlated-factor model had the best data fit as well as convergent and discriminant validity properties in both samples, although it was not invariant. The internal consistency of the scale was good. The total scores in ASS-20 followed a normal distribution and their average showed a liberal attitude with no difference between both samples. The correlation of ASS-20 with the two scales of attitude towards homosexuality was medium. It is concluded that AAS-20 shows internal consistency reliability, structural validity, and concurrent validity in relation to attitude towards homosexuality.

Key words: Attitude, sexuality, homosexuality, psychometrics, students.

INTRODUCTION

The attitude towards sexuality

Sexuality is an aspect of human behavior towards which society traditionally exercises strong control due to its implications for human bonding, progeny, inheritance,

and motivation. Although some societies are more liberal and others more repressive of human sexuality, none of them stop exercising control over sexuality or stop dictating the canon of morality, normality, and abnormality regarding sexual behavior (Clark, 2019).

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In Latin America, repressive discourses of sexuality that consider pornography and masturbation as something "sinful", homosexuality as something "against the law of God", and promiscuity and infidelity in women as something "immoral and deserving disgrace" have prevailed from the Colony to our times; it is only in the most cosmopolitan cities these discourses have lost strength although have not disappeared (Sanabria, 2019). On the other hand, social networks in which adolescents are constantly immersed (such as Twitter, Instagram, and YouTube) do not usually echo these repressive values. Likewise, civic education and secular sex education in public schools also do not support traditional moralizing discourses. On the contrary, homophobia is fought and gender equality is defended. Nevertheless, some of those people who provide this education, as well as many families to which adolescents belong and the churches they attend, defend moralizing repressive discourses. Thus, we live in a society in change and with contradictions (Imhoff et al., 2020; Moral, 2010; Pinos-Abad et al., 2017).

The students of the degrees of psychology and medicine, among which the present validation study of a measurement instrument is carried out, are evolutionarily late adolescents or are entering their adulthood and are economically dependent on their parents. They are immersed in these contradictory discourses, but they are being formed to contribute to the scientific and secular discourse about human sexual behavior. What is the attitude of these young people? What effect does this attitude have on various areas of your present behavior and on their professional work? These are relevant questions and their answers require reliable and valid measuring instruments.

If the objective to be assessed is the attitude towards sexuality, we first need to define such attitude. Attitude towards sexuality can be defined as a predisposition to express opinions, feel and act in the face of sexual objects (pornography), situations (nudity), different people (homosexuals, transvestites, transsexuals), social norms or customs (fidelity, virginity), and sexual behaviors (masturbation, oral sex, anal sex) (Moral and Ortega, 2008).

Measurement of attitude towards sexuality

There are several scales used to measure attitude towards sexuality. Some examples are the Sexual Conservatism Scale by Burt (1980) and the Brief Sexual Attitude Scale by Hendrick et al. (2006) developed in the United States. In Spanish language countries, there are some scales, such as the scale created by Lima-Serrano et al. (2013) in Spain and the scales developed by Honold (2005) and Moral and Ortega (2008) in Mexico.

The 20-item Attitude towards Sexuality Scale (ASS-20) by Moral and Ortega (2008) is a multifactorial scale with

good properties developed in the context of Mexican psychology students. The items of the ASS-20 were prepared from a qualitative study with a focus group. From 26 initially designed items, 20 were selected based on their properties of discriminability, internal consistency, and factorial configuration. In a sample of 395 students, the overall internal consistency was good (Cronbach's $\alpha = 0.84$), the scores on the scale followed a normal distribution (Kolmogorov-Smirnov $Z = 1.10$, Lilliefors' $p = 0.17$) and its average ($M = 2.37$; 95% CI: 2.32, 2.42; range 1-5) reflected a liberal attitude with no difference between both sexes. The number of factors was determined by the Cattell's criterion and was three. When extracting three factors by Principal Axis Factoring, 31.6% of the total variance was explained. After rotating the factor matrix by the Varimax method, a first factor with seven indicators was obtained and was named *appraisal of Virginity and Condemnation of Pornography* (VCP) due to its content (items 2, 4, 6, 8, 11, 15, and 19). Its internal consistency reliability was acceptable ($\alpha = 0.75$) and its scores adjusted to normal distribution (Kolmogorov-Smirnov $Z = 0.94$, Lilliefors' $p = 0.34$). The second factor with six indicators (items 1, 7, 9, 13, 14, and 17) was named *rejection of Masturbation and Sex* (MAS), its internal consistency reliability was also acceptable (Cronbach's $\alpha = 0.72$), its distribution was positively skewed, and did not follow a normal distribution (Kolmogorov-Smirnov $Z = 2.12$, Lilliefors' $p < 0.01$). The third factor with seven indicators (items 3, 5, 10, 12, 16, 18, and 20) was named *sexual Shyness, Shame and Modesty* (SSM), had a questionable internal consistency reliability (Cronbach's $\alpha = 0.67$), its distribution was also skewed to the right, and did not follow a normal distribution ($Z_{KS} = 1.70$, $p = 0.01$). By confirmatory factor analysis, estimating the parameters through the Maximum Likelihood method, the model of three correlated factors presented adequate fit indices: the relative chi-square ($\chi^2/df = 2.61$) was lower than 3, the Standardized Root Mean Square Residual (SRMR = 0.06) and the Root Mean Square Error of Approximation (RMSEA = 0.07) were lower than 0.08, and the Population Gamma Index (PGI = 0.93), Adjusted Population Gamma Index (APGI = 0.91), and Jöreskog's Goodness of Fit Indices (GFI = 0.93 and AGFI = 0.91) were higher than 0.90. The correlations between the three factors were positive and with an association strength that ranged from medium ($r = 0.45$ for the correlations of both the first and the second factor with the third factor) to high ($r = 0.54$ for the correlation between the first two factors), and therefore there was discriminant validity between the three factors (Moral and Ortega, 2008).

Honold (2005)'s 25-item Attitude towards Sexuality Scale (ASS-25), in its original study carried out with a sample composed of 150 women and 150 men, all of them psychology students, showed an acceptable overall internal consistency reliability (Cronbach's $\alpha = 0.72$), and

a structure of eight components that explained 57.4% of the total variance. The number of components to retain was determined using the Kaiser's criterion (eigenvalues greater than 1). The distribution of the total scores on the scale showed positive asymmetry and reflected a very conservative attitude with no difference between both sexes (Honold, 2005). Trejo-Pérez and Díaz-Loving (2013) eliminated one item and obtained an acceptable overall internal consistency reliability (Cronbach's $\alpha = 0.74$). They determined the number of components by the Cattell's criterion and it was four. These four factors explained 72.9% of the total variance. After an orthogonal rotation by the Varimax method, the first component reached an acceptable internal consistency reliability (Cronbach's $\alpha = 0.75$) and was named "sexism and stereotypes". The second component showed a questionable internal consistency reliability (Cronbach's $\alpha = 0.67$) and was named "morality". The third component had an unacceptable internal consistency reliability (Cronbach's $\alpha = 0.49$) and was named "restricted sexuality". The fourth presented a fair internal consistency (Cronbach's $\alpha = 0.54$) and was named "myths and taboos". In Mexico, Moral-Ortega ASS-20 compared Honold's ASS-25 had better psychometric properties.

Problem statement

The AAS-20 has been applied in other studies (Moral and Ortega, 2009; Moral, 2010), but its three-factor structure and other metric properties have not been subsequently verified. In the present study, the three factors are specified not only through the correlated-factor model, as in previous studies, but also through the hierarchical model and the bifactor model. In the correlated-factor model, each item is directly determined by a factor and a measurement error, and the factors are linearly interrelated. In the hierarchical model, each item is determined indirectly by a general higher-order factor and directly by a hierarchical lower-order factor and a measurement error. In the bifactor model, each item is directly determined by a general factor, a specific factor, and a measurement error. It should be noted that the use of a general score is theoretically justified in the last two models, whereas its justification is merely practical or utilitarian in the correlated-factor model (Dominguez-Lara and Rodríguez, 2017). In the three aforementioned models, it is required to check the convergent validity of each factor and the discriminant validity between the factors (Gignac and Kretzschmar, 2017). There exists convergent validity in a factor if the proportion of covariance between the items explained by the factor is higher than that explained by chance, that is, by non-attributable factors. There exists discriminant validity between two factors if a substantive proportion of variance shared between the items is exclusively attributable to the factor to which they belong and not to

the other factor (Henseler et al., 2015). If the variances attributable to the specific factors are trivial or the proportions of variance shared between the factors are unitary, then a single factor underlies (Gignac and Kretzschmar, 2017); consequently, the one-factor model must be tested as an alternative hypothesis to multi-factor model.

The objectives of this study are to test the validity of the three-factor model proposed in the original study carried out by Moral and Ortega (2008) using two samples, one composed of psychology students (as in the original study) and another one composed of medical students; to estimate the internal consistency reliability (variance proportion of the test scores measured without error); to describe the distributions of the scores on the scale and its factors; and finally, to verify the convergent validity in relation to the attitude towards male homosexuality, using two different measurement instruments.

The bifactor model is expected to have the best fit and good properties of convergent and discriminant validity, especially compared to the one-factor model, although it may not be strictly invariant between both types of students. Likewise, good reliability is expected in the scale and acceptable in its three factors, normal distribution in the scale and the factor of appraisal of virginity and condemnation of pornography, as well as a distribution with positive skewness in the other two factors (Moral and Ortega, 2009). Finally, the expectation is that there is a positive correlation with a medium strength of association between the attitude of rejection towards sexuality and the attitude of rejection towards gay men (Moral and Valle, 2014), since the attitude of rejection towards sexuality is usually consistent with prejudices towards sexual minorities, whose sexuality is disqualified as unnatural and promiscuous (Kite et al., 2020).

MATERIALS AND METHODS

Research design

The present non-experimental study is instrumental in its objectives and its design is cross-sectional.

Participants

The inclusion criteria were: being a student in the first semesters of the psychology and medicine career and age 18 to 26 years. The exclusion criterion was to express refusal to participate and the elimination criterion was to leave two or more questions unanswered in the two scales that were applied. Non-probability convenience sampling was used. The printed questionnaire was applied in the classrooms by the article authors. All participants invited to the study gave their consent and no case was required to be eliminated due to incomplete data. A sample composed of 402 psychology students and 198 medical students was obtained.

Table 1 describes and statistically compares the sociodemographic and sexual behavior variables of both samples. There was a difference in the sex ratio. In the sample of psychology

Table 1. Frequencies of sociodemographic and sexual behavior variables and their comparison between both samples.

Variable label	Value label	Psychology (n = 402)	Medicine (n = 198)	Pooled (n = 600)	Statistical test	p
Sex	Woman	302 (75.1%)	99 (59%)	401 (66.8%)	Yates $\chi^2(1)$	< 0.001
	Man	100 (24.9%)	99 (50%)	199 (33.2%)		
Age (years old)	17-18	95 (23.6%)	16 (8.1%)	111 (18.5%)	Welch t(495.27)	0.037
	19	133 (33.1%)	53 (26.8%)	186 (31%)		
	20	94 (23.4%)	89 (44.9%)	183 (30.5%)		
	21	43 (10.7%)	31 (15.7%)	74 (12.3%)		
	22	18 (4.5%)	4 (2%)	22 (3.7%)		
Marital status	Single	393 (97.8%)	198 (100%)	591 (98.5%)	$\chi^2(1)$	exacta < 0.001
	Other	9 (2.2%)	0 (0%)	9 (1.5%)		
Subjective socio- economic status	Lower-middle	44 (10.9%)	0 (0%)	44 (7.3%)	$\chi^2(1)$	0.034
	Middle-middle	306 (76.1%)	49 (24.7%)	355 (59.2%)		
	Upper-middle	52 (12.9%)	139 (70.2%)	191 (31.8%)		
	Higher	0 (0%)	10 (5.1%)	10 (1.7%)		
Religious affiliation	Roman Catholics	312 (77.6%)	156 (78.8%)	468 (78%)	$\chi^2(3)$	0.776
	Non-Catholic Christians	25 (6.2%)	15 (7.6%)	40 (6.7%)		
	Non-Christians	12 (3%)	6 (3%)	18 (3%)		
	None	53 (13.2%)	21 (10.6%)	74 (12.3%)		
Religiosity	N	52 (13%)	19 (9.6%)	71 (11.9%)	MW Z_u	0.407
	VI	60 (15%)	33 (16.7%)	93 (15.5%)		
	I	125 (31.2%)	56 (28.3%)	181 (30.2%)		
	F	119 (29.7%)	70 (35.4%)	189 (31.6%)		
	VF	45 (11.2%)	20 (10.1%)	65 (10.9%)		
Active sex life	No	171 (42.5%)	102 (52%)	273 (45.7%)	Yates $\chi^2(1)$	0.036
	Yes	231 (57.5%)	94 (48%)	325 (54.3%)		
Homosexual behavior	No	387 (96.3%)	185 (93.4%)	572 (95.3%)	Yates $\chi^2(1)$	0.180
	Yes	15 (3.7%)	13 (6.6%)	28 (4.7%)		

Notes: religiosity = frequency of attendance at religious services of the religion of ascription: n = never or no religious affiliation, vi = very infrequently; i = infrequently; f = frequently, and vf = very frequently. statistical test to compare two independent samples: yates $\chi^2(1)$ = pearson's chi-square test for homogeneity using the yates' continuity correction for the 2x2 contingency table, welch t (495.27) = student's t test applied to continuous variable of age with welch's formula due to the assumption of variance homogeneity was rejected by levene's test ($[1, 598] = 17.42, p < 0.001$), $\chi^2(df)$ = pearson's chi-square test for homogeneity with 1 or 3 degree of freedom (df), mw Z_u = mann-whitney u test using normal approximation. p = probability value. with pearson's chi-square tests, asymptotic probability values were reported when all the expected frequencies were higher than or equal to 1 and at least 80% higher than 5; when these conditions were not fulfilled, the exact probability value was calculated (exact). With mann-whitney test, the probability asymptotic value for a two-tailed test was reported. With t-test, the probability value for a two-tailed test was reported.

students there were three women per one man while in the sample of medical students there was one woman per one man. The effect size of career/university on sex ratio was small (Cramer's $V = 0.25$). Psychology students ($M = 19.59$; 95% CI: 19.44, 19.74) were significantly younger ($MD = -0.23$; 95% CI: -0.45, -0.01) than medical students ($M = 19.82$; 95% CI: 19.66, 19.99), although the effect size of career/university on age was trivial (Hedges' $g = 0.16$; 95% CI: -0.01, 0.33). The mean age in both samples corresponded to the late adolescence stage. There were also differences in the distribution of marital status. All medical students were single

whereas 2.2% of psychology students reported other marital status (married, cohabiting, and separated). The effect size of career/university on marital status was trivial (Cramer's $V = 0.09$). In subjective socioeconomic status, there was a clear difference, and this was higher in medical students. This is because the medical students came from a private university and the psychology students from a public one. The size effect of the career/university on the subjective socioeconomic status was large (Rosenthal's $r = 0.61$). The distribution of religious affiliation was homogeneous between both samples. Overall, 78% of students reported being

Roman Catholics, 12.3% having no religion (agnostics or atheists), 6.7% being non-Catholic Christians and 3% belonging to a non-Christian religion. There was no difference in the median of attendance at religious services between the two samples and it corresponded to "infrequent". The percentage of people with an active sexual life was higher among psychology students (57.5%) than among medical students (48%). This difference was maintained when controlling for age (Mantel-Haenszel's $\chi^2[1] = 5.18$, $p = 0.023$; fulfilling the assumption of homogeneity of the odds ratio among the five age groups by the Breslow-Day test: $\chi^2[5] = 7.54$, $p = 0.184$). However, the effect size of sample/university on being sexually active was trivial (Cramer's $V = 0.09$). The frequency of homosexual behaviors was statistically not different between both samples. Overall, 95.3% reported not having had homosexual behaviors compared to 4.7% who did (Table 1).

Instruments of measurement

The questionnaire is made up of the informed consent form, the sociodemographic data sheet, and two attitude scales, one towards sexuality and the other towards homosexuality. Twenty-item Attitude towards Sexuality Scale (ASS-20) (Moral and Ortega, 2008). Is composed of 20 items with a Likert-type response scale with five ordered categories of agreement level: SD = Strongly Disagree, D = Disagree, nAnD = neither Agree nor Disagree, A = Agree, and SA = Strongly Agree (Annex). Higher score reflects an attitude of greater rejection. The items 1, 3, 5, 6, 7, 9, 11, 13, 15, 17, and 19 are positively-keyed items and are scored in this way: TD = 1, SD = 2, nAnD = 3, SA = 4, and TA = 5. The items 2, 4, 8, 10, 12, 14, 16, 18, and 20 are negatively-keyed and are scored in this way: TD = 5, BD = 4, nAnD = 3, BA = 2, and TA = 1. The ASS-20 total score is obtained as an average score on the 20 items. First, the scores on the 20 items are summed and then this sum is divided by 20. The range of scores on the ASS-20 varies on a continuum from 1 to 5. By dividing this continuum into five intervals with the same amplitude (amplitude = [maximum value in the item - minimum value in the item] / number of values in the item = [5-1]/5 = 0.8), the score on the scale can be interpreted in an absolute sense from the response label of the items. A score from 1 to 1.79 reflects an attitude of decided acceptance, from 1.80 to 2.59 an attitude of acceptance, from 2.6 to 3.39 an ambiguous or ambivalent attitude, from 3.4 to 4.19 an attitude of rejection, and from 4.20 to 5 an attitude of decided rejection. The ASS-20 is made up of three factors: appraisal of virginity and condemnation of pornography (VCP) (items 2, 4, 6, 8, 11, 15, and 19), rejection of masturbation and sex (MAS) (items 1, 7, 9, 13, 14, and 17) and sexual shyness, shame and modesty (SSM) (items 3, 5, 10, 12, 16, 18, and 20). Its metric properties were presented in the Introduction section.

Ten-item Attitude towards Homosexuality Scale (AHS-10) (Moral and Ortega, 2008): It comprised 10 items with a Likert-type response scale with five ordered categories. Higher score reflects higher rejection of male homosexuality. The items 1, 3, 5, 7, and 9 are positively-keyed items and are scored from 1 to 5. The items 2, 4, 6, 8, and 10 are negatively-keyed items and are scored from 5 to 1. The AHS-10 score is obtained as an average score on the 10 items. First, the scores on the 10 items are summed and then this sum is divided by 10. The range of AHS-10 varies on a continuum from 1 to 5 and can be interpreted in the same way as the ASS-20. The overall internal consistency reliability was good (Cronbach's α from 0.84 to 0.87), its structure was one factor by Kaiser's criterion, the single-factor model showed an acceptable fit to the data by Maximum Likelihood, and the scores on AHS-10 followed a normal distribution (Moral and Ortega, 2008; Moral and Martínez-Sulvarán, 2011). The AHS-10 was administrated only among psychology students and its reliability in this sample was excellent (ordinal $\alpha = 0.90$).

Subscale of Subtle rejection Attitude Towards Gay men (ATG-S) (Moral and Valle, 2011) from the Attitudes Towards Lesbians and Gay men (ATLG) Scale (Herek, 1984): It comprised five items with a Likert-type response scale with five ordered categories that are scored from 1 to 9. It is derived from the three-factor structure reported by Moral and Valle (2011) for the ATLG scale. Higher scores show greater rejection. The contents included are: qualification of male homosexuality as a natural sexual orientation and sex between men as a natural behavior, marriage between two men, the adoption of children by homosexual couples, and homosexuality in a male child. It is composed of three positively keyed items (G1, G5, and G7), which are scored: 1 = totally agree, 3 = agree, 5 = neither agree nor disagree, 7 = disagree, and 9 = totally disagree, as well as two negatively-keyed items (G8 and G9), which are scored from 9 = totally agree to 1 = totally disagree. The ATG-S score is obtained as an average score in the 5 items. First, the scores on the five items are summed and then this sum is divided by 5. The range of scores on the ATG-S varies on a continuum from 1 to 9. By dividing this continuum into five intervals with the same amplitude ($a = [9-1]/5 = 1.6$), the score on the scale can be interpreted in an absolute sense from the response label of the items. A score from 1 to 2.59 reflects an attitude of decided acceptance, from 2.60 to 4.19 an attitude of acceptance, from 4.20 to 5.79 an ambiguous attitude, from 5.80 to 7.39 an attitude of rejection, and from 7.40 to 9 an attitude of decided rejection. Its overall internal consistency reliability was adequate (Cronbach's $\alpha = 0.78$). The distribution of scores on ATG-S was mesokurtic ($Z_K = -0.18$), but showed slight positive asymmetry ($Z_{Sk} = 4.77$); therefore, it did not fit a model of normal distribution (Moral and Valle, 2014). The ATG-S was administrated only among medical students and its reliability in this sample was good (ordinal $\alpha = 0.86$).

Procedure

The permission and approval of the academic authorities of the two faculties in which the data were collected was obtained. The informed consent of the students was requested for their participation in the research. This appeared on the first page of the questionnaire. No personally identifiable information was requested to guarantee the anonymity of the responses. The name and email address of those responsible for the research were provided to request information in relation to any concern raised by this study. In this way, the ethical research standards of the American Psychological Association (2017) were fulfilled.

Data analysis

For the first objective of testing the validity and invariance of four hypothetical models across the two types of students, multigroup confirmatory factor analysis was used. Models nested in constraints (equality of parameters between the two samples) were defined. The discrepancy function was optimized through the Unweighted Least Squares method. Moment matrices (arithmetic mean, standard deviation, and polychoric correlation) were used as input data. The nested model with constraints on intercepts could not be tested, because we opted for this method, which is suitable for ordinal variables, such as items with a Likert-type scale. The standard deviation, 95% confidence interval, and the significance test for each parameter were calculated through Bias-Corrected Percentiles with the extraction of 2,000 bootstrap samples. The parameters between the two samples were compared by the Z test, using the bootstrap standard error of each parameter. The fit of the models to the data was assessed using eight indices: χ^2/df = relative chi-square, GFI = Goodness-of-Fit Index, AGFI = Adjusted Goodness-of-Fit Index, NFI = Normed Fit Index, CFI = Comparative Fit Index, RFI = Relative Fit Index, SRMR = Standardized Root

Mean Square Residual, and RMSEA = Root Mean Square Error of Approximation. It was stipulated that values for $\chi^2/df \leq 2$, GFI, NFI, CFI and RFI ≥ 0.95 , AGFI ≥ 0.90 , and SRMR and RMSEA ≤ 0.05 reflect a close fit. On the other hand, values for $\chi^2/df \leq 3$, GFI, NFI, CFI and RFI ≥ 0.90 , AGFI ≥ 0.85 , SRMR < 0.10 and RMSEA < 0.08 reflect an acceptable fit. The equivalence in goodness of fit between the nested models was evaluated by the quotient between the difference in chi-square statistics and the difference in their degrees of freedom ($\Delta\chi^2/\Delta df \leq 3$ for acceptable value and ≤ 2 for a close value) the difference in the Akaike Information Criterion ($\Delta AIC < 7$ for acceptable value and < 2 for a close value) and the difference in the GFI, NFI, CFI, RFI, RMSEA and SRMR statistics ($\Delta GFI, \Delta NFI, \Delta CFI, \Delta RFI, \Delta RMSEA, \text{ and } \Delta SRMR \leq 0.01$) (Byrne, 2016).

In the single-factor and correlated-factor models, the convergent validity of each factor was established through three criteria: omega coefficient or compound reliability (ω) ≥ 0.70 , average of the standardized measurement weights $M_\lambda > 0.50$, and Mean Variance Extracted (AVE) ≥ 0.25 for 7 or 12 indicators and 0.28 for 6 indicators (Moral, 2019).

In the correlated-factor model, the discriminant validity between factors was established through the heterotrait-monotrait ratio of correlations (HTMT). The HTMT is calculated as the ratio between the arithmetic mean of the $n \times m$ non-redundant correlations of the items crossed between two factors and the geometric mean of the means of the $[n \times (n-1)]/2$ or $[m \times (m-1)]/2$ non-redundant correlations between the n or m items of each factor. It was stipulated that an HTMT value ≤ 0.85 reflects discriminant validity or at least ≤ 0.90 (Henseler et al., 2015).

In the hierarchical model, two sub-models are distinguished. On one hand, there is the higher-order submodel that corresponds to the direct effect of the general higher-order factor (GF) on the three hierarchical lower-order factors (HF). On the other hand, there is the lower-order submodel that corresponds to both the indirect effect of the general higher-order factor and the direct effect of the hierarchical lower-order factor on each item of a content domain. In the higher-order submodel, only convergent validity is assessed and it was done as in the single-factor model ($\omega \geq 0.70$, $M_\lambda > 0.50$ and AVE ≥ 0.44 for three indicators). In the lower-order submodel, as in the bifactor model, both convergent and divergent validity are checked for items in each content domain. The discriminant validity or contribution of each (hierarchical and high-order or specific and general) factor was assessed through six indices: the Average Variance Explained by the hierarchical lower-order factor (AVE_HF) and general higher-order factor (AVE_GF) or by the specific factor (AVE_SF) and general factor (AVE_GF), the Common Variance Explained by the hierarchical lower-order factor (ECV_HF) and general higher-order factor (ECV_GF) or by the specific factor (ECV_SF) and general factor (ECV_GF), as well as McDonald's hierarchical omega related to the hierarchical lower-order factor (ω_{h_HF}) and general higher-order factor (ω_{h_GF}) or to the specific factor (ω_{h_SF}) and general factor (ω_{h_GF}). Values between 0.30 and 0.70 for $\omega_{h_}$ and ECV_ indices reflect a significant and balanced contribution; values below 0.30 indicate a poor contribution, and values above 0.70 an excessive contribution (Brunner et al., 2012; Domínguez-Lara and Rodríguez, 2017). Considering the minimum AVE_ values (≥ 0.44 for three indicators, ≥ 0.28 for six indicators and ≥ 0.25 for seven indicators or more) and a contribution of at least 30%, the minimum AVE values for the hierarchical lower-order factor (AVE_HF), specific factor (AVE_SF) or higher-order or general factor (AVE_GF) should be 0.14, 0.09, and 0.08, respectively. The maximum value would be 0.70 for a maximum contribution of 70% when explaining 100% of the variance (Moral, 2019). Convergent validity was established from the total effect or sum of direct effect of lower-order hierarchical factor and indirect effect of general higher-order factor (hierarchical model) or the sum of direct effects of specific and general factors (bifactor model). As previously, three criteria were used: AVE_ total

≥ 0.25 for seven or twelve indicators and 0.28 for six indicators, $M_{\lambda_total} > 0.50$ and $\omega_{h_total} \geq 0.70$.

For the second objective, the internal consistency reliability of each factor was calculated through the ordinal alpha coefficient (ordinal α), which is obtained by calculating the standardized alpha coefficient from the polychoric correlation matrix. It was stipulated that ordinal α values between 0.70 and 0.79 reflect an acceptable internal consistency, between 0.80 and 0.89 good, and ≥ 0.90 excellent (Viladrich et al., 2017). Interval estimations with a 95% confidence level were calculated using the formula of Feldt et al. (1987) and coefficients between the two samples were compared through Feldt's (1969) test.

For the third objective of describing the distributions, fitting the scores to a normal distribution was tested using the D'Agostino K^2 test (D'Agostino et al., 1990). This test is based on the transformation to normality of the coefficients of skewness (D'Agostino, 1970) and kurtosis (Anscombe and Glynn, 1983). This statistic (D'Agostino and Pearson, 1973) was also calculated using the Fisher-Pearson standardized moment coefficients of skewness and kurtosis (Fisher, 1930). Following the suggestion made by D'Agostino et al. (1990), it was complemented with the normal quantile-quantile plot, which was quantitatively assessed through the correlation between the theoretical and empirical quantiles. A 95% confidence interval for the correlation that includes 1 reflects a good fit to normality.

As the model with constraints on intercepts could not be tested, the means between the two samples were compared through Hotelling's T^2 test, assuming homogeneity of covariances between the two samples. This assumption was checked using Box's M test. The assumption of multivariate normality was tested by the multivariate version of the Jarque-Bera test (Koizumi et al., 2009). Following the recommendations of the study on the power of multivariate normality statistics (Joenssen and Vogel, 2014), multivariate asymmetry was calculated by the Kankainen-Taskinen-Oja (2007) U statistic, which follows a chi-square distribution with both degrees of freedom as variables are included in its calculation (k). The standardized value of this statistic (Z_U) was also calculated, using the Wilson-Hilferty (1931) transformation of chi-squared variables to normality. Multivariate kurtosis was calculated using the Mardia's statistic b_2 , which follows a standard normal distribution by subtracting its mathematical expectation or mean, $\mu_{b_2} = k^*(k+2)$, and dividing this difference by its standard error: $\sigma_{b_2} = \sqrt{[(8*k*(k+2))/n]}$, where n is the sample size (Mardia, 1970). On the other hand, the means among the factors within each sample were compared using repeated measures analysis of variance. Pairwise comparisons were made by the paired-sample t-test with the Bonferroni's correction for significance level.

For the fourth objective of concurrent validity, the correlations were calculated by Pearson's product-moment coefficient (r), their significance ($H_0: \rho = 0$) was tested by Fisher's Z test, and Fisher's transformation was also used to calculate 95% confidence intervals, following SPSS convention. Bivariate normality was verified by tests based on asymmetry (Kankainen-Taskinen-Oja U-test), kurtosis (Mardia's Z-test), and multivariate version of the Jarque-Bera test, using two previous multivariate statistics. In all cases, there was a good approximation to bivariate normality. Values of $|r| < 0.10$ were interpreted as a trivial association strength, between 0.10 and 0.29 weak, between 0.30 and 0.49 medium, between 0.50 and 0.69 strong, between 0.70 and 0.89 very strong, and ≥ 0.90 perfect. The same thresholds were also used to interpret the size of the effect of the factors on their indicators estimated through the standardized measurement weights (Byrne, 2016). The significance of the difference in Pearson's correlation coefficients between the two samples were tested using Fisher's Z test and within each sample using Steiger's Z test. The significance level was set at 0.05 and the calculations were made with the programs SPSS 24, module R version 2.4 for SPSS 24, AMOS 16, and Real Statistics Resource Pack for Excel 2013.

RESULTS

Testing the fit and invariance of hypothetical models across psychology and medical students, convergent validity of each factor, and discriminant validity between factors

Table 2 shows the fit indices of the four hypothesized models for the ASS-20 (1F = single factor, CF-3 = three correlated factors, HM-3 = hierarchical model with one general higher-order factor and three hierarchical lower-order factors, and BM-3 = bifactor model with one general factor and three specific factors). Since a multigroup analysis was performed, models nested in constrains were specified within each of the four hypothesized models. The four common nested models in the four hypothesized models were: the unconstrained model (UC), with constraints on measurement weights (MW), with constraints on the structural covariances (SC), and with constraints on measurement error variances (ME). The hierarchical model (HM-3) had two additional nested models: on the structural weights (SW) and on the structural error variances (SE), which were associated with the higher-order submodel or direct effect of the general higher-order factor on the three hierarchical lower-order factors. Table 2 shows the comparison between goodness-of-fit indices between the factorial model with the best fit (BM-3) and the other factorial models (1F, CF-3, and HM-3). Table 3 shows the convergent validity indices of the single-factor model (1F) and three correlated factors (CF-3), and the discriminant validity indices between the factors of this last model. Table 4 shows the convergent and discriminant validity indices of the hierarchical model (HM-3) and bifactor model (BM-3).

The one-factor model

The one-factor model (1F) showed that all its parameters were significant in the four nested models when being estimated in both student samples. In the nested with constraints on measurement error variances (ME), whose estimates are exactly the same for both samples, the single factor with 20 indicators showed convergent validity: $M_\lambda = 0.53$, with a minimum of 0.41 and a maximum of 0.76, AVE = 0.30 > 0.25 and $\omega = 0.99 > 0.70$ (Table 3).

The fit of the unconstrained model (UC) was close through four indices (GFI, AGFI, CFI, and RMSEA) and acceptable through four (χ^2/df , NFI, RFI, and SRMR) (Table 2). In this model, there were significant differences in 8 out of the 20 (40%) measurement weights, the structural or factor variance, and 5 out of the 20 (25%) error variances between the two samples. The variance of the factor ($Z = -2.97$, $p = 0.003$) and the measurement weights of items 9 ($Z = -3.04$, $p = 0.002$), 14 ($Z = -2.08$, $p = 0.038$), and 19 ($Z = -2.28$, $p = 0.023$) were higher in medical students than in psychology students. In addition, the measurement weights of items 4 ($Z = -2.26$, $p = 0.024$), 6 ($Z = -4.14$, $p < 0.001$), 15 ($Z = -3.14$, $p = 0.002$), and 17 ($Z = -3.67$, $p < 0.001$) were higher and their error variances were lower in medical students than in psychology students. On the contrary, the measurement weight of item 13 ($Z = 2.17$, $p = 0.030$) was higher and its error variance was lower ($Z = -4.86$, $p < 0.001$) in psychology students than in medical students. The goodness of fit of the unconstrained model (UC) was higher when is compared to the other three nested models for single-factor model ($\Delta\chi^2/df > 3$, $\Delta AIC > 10$, ΔGFI , $\Delta AGFI$, ΔNFI , ΔCFI , and $\Delta RFI > 01$). In the nested model with constraints on measurement error variances (ME), which presented the worst fit among the nested models for the one-factor model, the fit was acceptable through seven indices, although bad through one (RMSEA > 0.08) (Table 2). The goodness of fit of the single-factor model (1F), compared to the other three hypothesized models (CF-3, HM-3, and BM-3), was the lowest in each of the four nested models through the indices $\Delta\chi^2/df > 3$, $\Delta AIC > 10$, ΔGFI , $\Delta AGFI$, ΔNFI , ΔCFI , ΔRFI , $\Delta RMSEA$, and $\Delta SRMR > 01$ (Table 2).

The model of three correlated factors (CF-3) showed that all its parameters were significant in the four nested models when they were estimated in the two samples of students. In the nested with constraints on measurement error variances (ME), whose estimated values are the same in the two samples, the three factors showed convergent validity (M_λ from 0.53 to 0.67 > 0.50, AVE from 0.29 to 0.45 > 0.28, ω from 0.95 to 0.99 > 0.70) and discriminant (HTMT from 0.61 to 0.86 < 0.90) (Table 3).

The three correlated factor model

The fit of the unconstrained model (UC) was good through seven indices and acceptable through one (SRMR = 0.06) (Table 2). In this model, there were significant differences in 6 out of the 20 (30%) measurement weights, in one out of the three (33.3%) structural variances, one out of the three (33.3%) structural correlations, and 5 out of the 20 (25%) measurement error variances. The measurement weights of items 6 ($Z = -4.13$, $p < 0.001$), 15 ($Z = -3.01$, $p = 0.003$), and 17 ($Z = -3.27$, $p = 0.001$) were higher and their error variances were lower ($Z = 2.81$, $p = 0.005$ in item 6; $Z = 3.07$, $p = 0.002$ in item 15; and $Z = 3.01$, $p = 0.003$ in item 17) in medical students than in psychology students. In addition, the correlation between the first two factors ($Z = -2.21$, $p = 0.027$) and the measurement weights of items 9 ($Z = -2.85$, $p = 0.004$) and 19 ($Z = -1.97$, $p = 0.049$) were higher in medical students than in psychology students. On the contrary, the measurement weight of item 13 ($Z = 2.66$, $p = 0.008$) was higher and its error variance lower ($Z = -5.15$, $p < 0.001$) in psychology

Table 2. Multigroup analysis for the four hypothesized models for ASS-20: fit indices and goodness-of-fit comparison between the model with the best fit (BM-3) and the rest of the models.

Indices	1F	CF-3	HF-3	BM-3	1F	CF-3	HF-3	BM-3
	UC				MW			
χ^2	692.986	355.137	355.137	282.918	893.133	510.764	510.764	489.367
df	340	334	334	300	359	351	351	336
χ^2/df	2.038	1.063	1.063	0.943	2.488	1.455	1.455	1.456
GFI	0.958	0.979	0.979	0.983	0.946	0.969	0.969	0.971
AGFI	0.949	0.973	0.973	0.976	0.937	0.963	0.963	0.963
NFI	0.935	0.967	0.967	0.974	0.917	0.952	0.952	0.954
CFI	0.967	0.998	0.998	1	0.950	0.985	0.985	0.985
RFI	0.928	0.962	0.962	0.967	0.912	0.948	0.948	0.948
RMSEA	0.042	0.010	0.010	0	0.050	0.028	0.028	0.028
RMR SR	0.078	0.057	0.057	0.050	0.084	0.063	0.063	0.060
AIC	852.986	527.137	527.137	522.918	1015.133	648.764	648.764	657.367
$\Delta\chi^2/\Delta df$	10.252	2.124	2.124	-	17.555	1.426	1.426	
ΔAIC	330.068	4.219	4.219		357.766	-8.603	-8.603	
ΔNFI	0.039	0.007	0.007		0.037	0.002	0.002	
ΔCFI	0.033	0.002	0.002		0.035	0.001	0.001	
ΔRFI	0.039	0.005	0.005		0.036	0	0	
$\Delta RMSEA$	0.042	0.010	0.010		0.022	0.000	0.000	
$\Delta SRMR$	0.027	0.006	0.006		0.024	0.003	0.003	
		SC				ME		
χ^2	1028.244	690.409	632.983	640.807	1072.956	735.122	735.122	685.519
df	360	357	354	340	380	377	377	360
χ^2/df	2.856	1.934	1.788	1.885	2.824	1.950	1.950	1.904
GFI	0.938	0.959	0.962	0.962	0.936	0.956	0.956	0.959
AGFI	0.928	0.951	0.955	0.953	0.929	0.951	0.951	0.952
NFI	0.904	0.936	0.941	0.940	0.900	0.931	0.931	0.936
CFI	0.938	0.968	0.973	0.971	0.935	0.965	0.965	0.968
RFI	0.899	0.931	0.937	0.933	0.900	0.931	0.931	0.932
RMSEA	0.056	0.039	0.036	0.038	0.055	0.040	0.040	0.039
SRMR	0.085	0.066	0.065	0.062	0.083	0.064	0.064	0.060
AIC	1148.244	816.409	764.983	800.807	1152.956	821.122	821.122	805.519
$\Delta\chi^2/\Delta df$	19.372	2.918	-0.559		19.372	2.918	2.918	
ΔAIC	347.437	15.602	-35.824		347.437	15.603	15.603	
ΔNFI	0.036	0.004	-0.001		0.036	0.005	0.005	
ΔCFI	0.033	0.003	-0.002		0.033	0.003	0.003	
ΔRFI	0.034	0.002	-0.004		0.032	0.001	0.001	
$\Delta RMSEA$	0.017	0.001	-0.002		0.016	0.001	0.001	
$\Delta SRMR$	0.023	0.004	0.003		0.024	0.004	0.004	

Notes: Models hypothesized for the ASS-20: 1F = single-factor model, CF-3 = model with three correlated factors, HF-3 = hierarchical model with one general higher-order factor and three hierarchical lower-order factors, and BM-3 = bifactor model with three specific factors and a general factor. Models nested in constraints: UC = unconstrained model, MW = with constraints on the measurement weights, SC = with constraints on the structural covariances, and ME = with constraints on the measurement error variances.

students than in medical students. The variance of the third factor of sexual shyness, shame and modesty was higher in psychology students than in medical students ($Z = 2.32$, $p = 0.020$).

The goodness of fit of the unconstrained model (UC) was greater compared to the other three nested models

for correlated-factor model ($\Delta\chi^2/df > 3$, $\Delta AIC > 10$, ΔGFI , $\Delta AGFI$, ΔNFI , ΔCFI , ΔRFI , and $\Delta SRMR > 0.1$). In the nested model with constraints on measurement errors (ME), which had the worst fit among the nested models for the correlated-factor model, the fit was good through seven indices and acceptable through one ($SRMR = 0.06$)

Table 3. Single-factor (1F) and three correlated-factor (CF-3) models: internal consistency and convergent validity of the factors and discriminant validity between the factors.

Model	Factor	Ordinal α (95% CI)			From ME model			HTMT			
		Psy	Med	Pool	AVE	M_λ	ω	Psy	Med	Pool	
1F	GF	0.879 (0.861, 0.895)	0.905 (0.885, 0.922)	0.887 (0.873, 0.899)	0.295	0.535	0.993	O	0.674	0.753	0.699
	VCP	0.792 (0.759, 0.820)	0.850 (0.816, 0.878)	0.813 (0.789, 0.834)	0.394	0.620	0.961	MAS	0.624	0.749	0.661
CF-3	MAS	0.836 (0.810, 0.859)	0.859 (0.826, 0.886)	0.844 (0.824, 0.862)	0.454	0.667	0.958	SSM	0.613	0.662	0.630
	SSM	0.701 (0.654, 0.742)	0.705 (0.638, 0.760)	0.702 (0.664, 0.736)	0.285	0.530	0.947				

Samples: Psy = 402 psychology students, Med = 198 medical students, and Pool = pooled sample composed of 600 health science students resulting from the union of both samples. GF = items 1 to 20 that make up the general factor of attitude (ASS-20), VCP = items 2, 4, 6, 8, 11, 15, and 19 that make up the appraisal of virginity and condemnation of pornography factor, MAS = items 1, 7, 9, 13, 14, and 17 that make up the rejection of masturbation and sex factor, SSM = items 3, 5, 10, 12, 16, 18, and 20 that make up the sexual shyness, shame and modesty factor. Ordinal α = ordinal alpha coefficient based on the average of the polychoric correlations. 95% CI = 95% confidence interval, using the formula of Feldt et al. (1987). ME = convergent validity measures calculated with the standardized measurement weights of the nested model with constraints on the measurement error variances for the single-factor model (GF) or correlated-factor model (F1, F2 and F3): AVE = Average Variance Extracted, M_λ = arithmetic mean of the measurement weights and ω = omega or composite reliability coefficient. HTMT = heterotrait-monotrait ratio of polychoric correlations in the sample of psychology or medical students or in pooled sample, either among the three factors (O = overall) or between two factors (F1 and F2, F1 and F3 and F2 and F3).

Table 4. Convergent validity and contribution of the general factor and the hierarchical or specific factors (discriminant validity).

ASS-20	MA			AVE			ECV			ω_h		
Hierarchical model with a general higher-order factor and three hierarchized lower-order factors												
	GF	HF	Total	GF	HF	Total	GF	HF	GF	HF	Total	
Higher-order submodel			0.840			0.714					0.881	
VCP	0.448	0.429	0.620	0.205	0.189	0.394	0.521	0.479	0.425	0.391	0.816	
Lower-order submodel	MAS	0.618	0.250	0.667	0.390	0.064	0.454	0.859	0.141	0.713	0.117	0.830
SSM	0.462	0.260	0.530	0.216	0.068	0.285	0.760	0.240	0.558	0.176	0.733	
Overall	0.504	0.316	0.603	0.265	0.109	0.374			0.659	0.259	0.919	
Bifactor model with a general factor and three specific factors												
	GF	SF	Total	GF	SF	Total	GF	SF	GF	SF	Total	
VCP	0.448	0.430	0.625	0.206	0.196	0.402	0.513	0.487	0.426	0.393	0.819	
MAS	0.620	0.251	0.686	0.391	0.092	0.483	0.810	0.190	0.720	0.118	0.838	
SSM	0.461	0.267	0.541	0.216	0.079	0.295	0.733	0.267	0.552	0.186	0.738	
Overall	0.504	0.319	0.614	0.265	0.124	0.389	0.682	0.318	0.657	0.264	0.921	

Notes: ASS-20 = 20-item Attitude Towards Sexuality Scale, VCP = items 2, 4, 6, 8, 11, 15, and 19 related to the appraisal of virginity and condemnation of pornography, MAS = items 1, 7, 9, 13, 14, and 17 related to the rejection of masturbation and sex, SSM = items 3, 5, 10, 12, 16, 18, and 20 related to sexual shyness, shame and modesty, and Overall: items from 1 to 20 related to attitude towards sexuality. Models: Model: GF = general factor, HF = hierarchical factor, SF = specific factor, and Total = sum of the effects of the general factor and the hierarchical or specific factor. M_λ = Arithmetic mean of the measurement weights, AVE = mean variance extracted, ECV = explained common variance and ω_h = hierarchical omega coefficient. In the hierarchical model, two submodels are distinguished: the higher-order submodel that corresponds to the direct effect of the general factor on the three hierarchical factors, and the lower-order submodel that corresponds to the indirect effect of the general factor and the direct effect of the hierarchical factor on the items from a content domain.

(Table 2 and Figure 1). The goodness of fit of the three correlated factor model (CF-3) was equivalent to that of the hierarchical model (HM-3), except in the nested model

with constraints on structural covariances, which was better in the hierarchical model through the indices $\chi^2/df = 19.14 > 3$ and $\Delta AIC = 51.43 > 7$. With respect to the

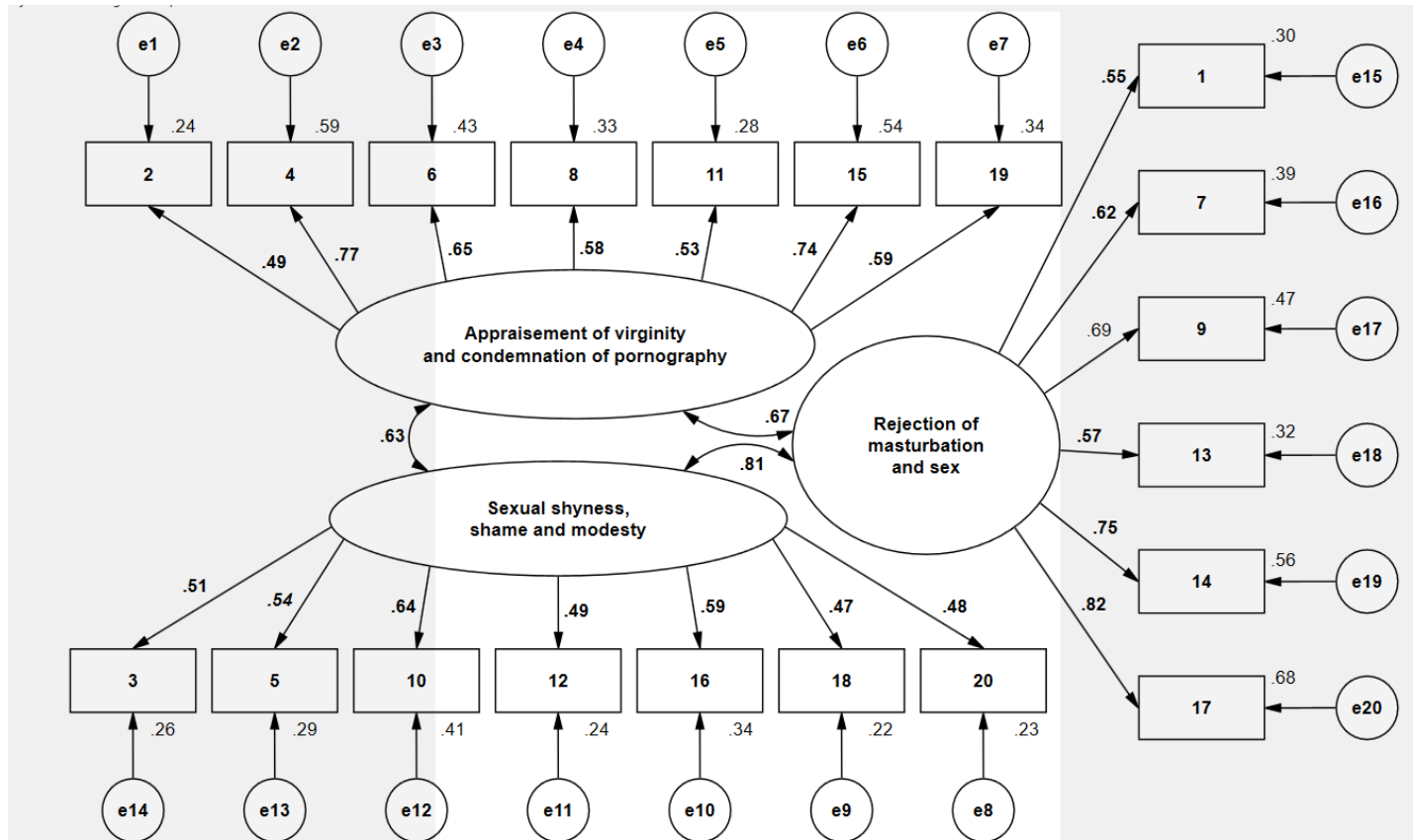


Figure 1. Model with constraints on measurement error variances (ME) for the three correlated factor model (CF-3).

bifactor model (BM-3), the only index that showed a difference was Akaike's index. This index favored the three correlated factor model in the nested model with constraints on the measurement weights ($\Delta AIC = -8.60$), but favored the bifactor model in the nested models with constraints on the structural covariances ($\Delta AIC = 15.60$) and on error variances ($\Delta AIC = 15.60$) (Table 2).

The hierarchical model

The hierarchical model (HM-3) showed that all its parameters were significant in the six nested models when being estimated in the two samples of students. In the higher-order submodel, the general factor showed convergent validity ($AVE = 0.71 > 0.44$ and $\omega = 0.88 > 0.70$). In the lower-order submodel, the three hierarchical factors also showed convergent validity with a measurement weight mean > 0.50 (M_λ from 0.53 to 0.67), the $AVE > 0.28$ (AVE_{total} from 0.29 to 0.45) and $\omega > 0.70$ (ω_{total} from 0.83 to 0.73). However, the direct effect of the hierarchical factor was poor both in the masturbation factor and in that of sexual shyness, shame and modesty ($AVE_{HF} < 0.08$, ω_{HF} and $ECV_{HF} < 0.30$); even in the total evaluation the effect of the

hierarchical factors was poor ($\omega_{HF} = 0.26$ and mean of $ECV_{HF} = 0.29 < 0.30$).

The fit of the unconstrained model (UC) was close through seven indices and acceptable through one ($SRMR = 0.06$) (Table 2). In this model, in the higher-order submodel the structural weights and structural error variances were equivalent between the two samples. However, in the lower-order model, there were significant differences in six out of the 20 (30%) (total) measurement weights and five out of the 20 (20%) measurement error variances. The measurement weights of virginity and condemnation of pornography factor on items 6 ($Z = -4.13$, $p < 0.001$), 15 ($Z = -3.01$, $p = 0.003$), and 19 ($Z = -1.97$, $p = 0.049$), as well as the measurement weights of the masturbation factor on items 9 ($Z = -2.85$, $p = 0.004$) and 17 ($Z = -3.27$, $p = 0.001$) were higher in medical students than in psychology students. In addition, the measurement error variances of items 4 ($Z = 3.09$, $p = 0.002$), 6 ($Z = 2.81$, $p = 0.005$), 15 ($Z = 3.07$, $p = 0.002$), and 17 ($Z = 3.01$, $p = 0.003$) were lower in medical students than in psychology students. On the contrary, the weight of the masturbation factor on item 13 was higher ($Z = 2.66$, $p = 0.008$) and its error variance was lower ($Z = -5.15$, $p < 0.001$) in psychology students than in medical students.

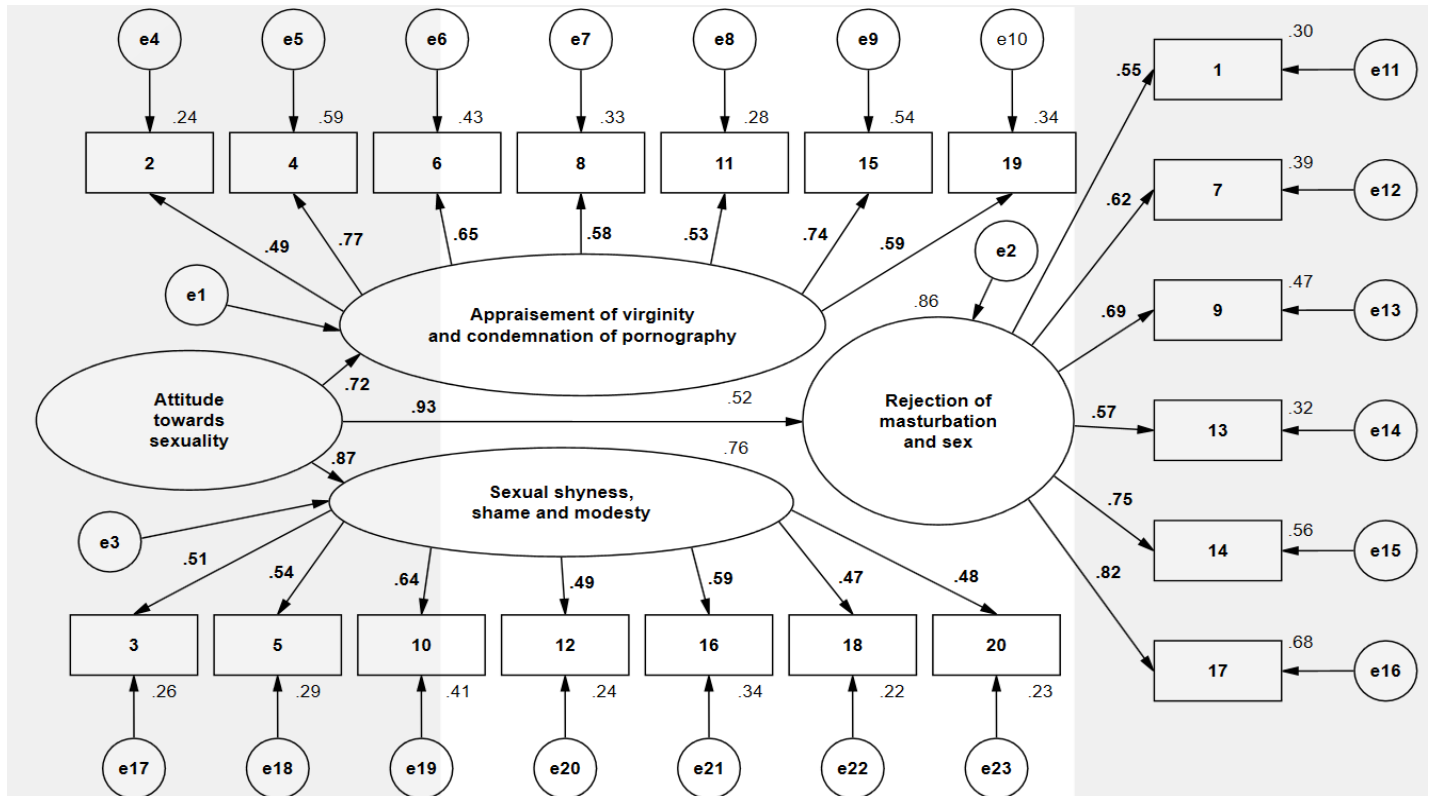


Figure 2. Model with constraints on measurement error variances (ME) for the hierarchical factor model (HM-3).

The goodness of fit of the unconstrained model (UC) was better compared to the other five nested models for hierarchical model through the indices $\Delta\chi^2/df > 3$, $\Delta AIC > 10$, ΔGFI , $\Delta AGFI$, ΔCFI , ΔRFI and $\Delta RMSEA > 01$ In the model with constraints on measurement error variances (ME), which had the worst fit among the nested models for the hierarchical model, the fit was close through five indices and acceptable through three (NFI, RFI, and SRMR) (Table 2 and Figure 2). The goodness of fit of the hierarchical model (HM-3) was equivalent to that of the correlated-factor model (CF-3), except in the nested model with constraints on structural covariances, which was better in the hierarchical model through the indices χ^2/df and ΔAIC , as previously mentioned. With respect to the bifactor model (BM-3), the only index that showed a difference was Akaike's index. This index favored the hierarchical model in the nested models with constraints on the measurement weights ($\Delta AIC = -8.60$) and on the structural variances ($\Delta AIC = -35.82$), but it favored the bifactor model in the nested model with constraints on measurement error variances ($\Delta AIC = 15.60$) (Table 2).

The bifactor model

In the unconstrained model (UC), 10 out of the 40 measurement weights were not significant. The weight of

the specific factor of masturbation was not significant for items 1 and 7 in both samples and for items 9, 13, and 14 in the sample of medical students. The weight of the specific factor of sexual shyness, shame and modesty was not significant for item 12 in both samples and for items 3, 5, 10, and 16 in the sample of medical students. When all the parameters are restricted (ME), 5 out of the 40 measurement weights were not significant: the weight of the masturbation factor for items 1, 7, and 14, and the weights of the sexual shyness, shame and modesty factor for items 3 and 5.

The three specific factors and the general factor showed convergent validity ($M\lambda_{total}$ from 0.54 to 0.69 > 0.50 , AVE_{total} from 0.30 to 0.48 > 0.28 , ω_{total} from 0.74 to 0.92 > 0.70). The effect of the specific factor was poor both on the six masturbation items ($ECV_{SF} = 0.19$ and $\omega_h = 0.12 < 0.30$) and in the seven items of sexual shyness, shame and modesty ($AVE_{SF} < 0.08$, $ECV_{SF} = 0.27$ and $\omega_h = 0.19 < 0.30$). On the contrary, the effect of the general factor was excessive on these two factors ($ECV_{GF} = 0.81$ and $\omega_h_{GF} = 0.72$ in masturbation and $ECV_{GF} = 0.73$ in sexual shyness, shame and modesty) (Table 4).

The goodness of fit of the unconstrained model (UC) was close through the eight indices (Table 2). In this nested model, there were differences in 9 out of the 40 (22.5%) measurement weights and in 4 out of the 20

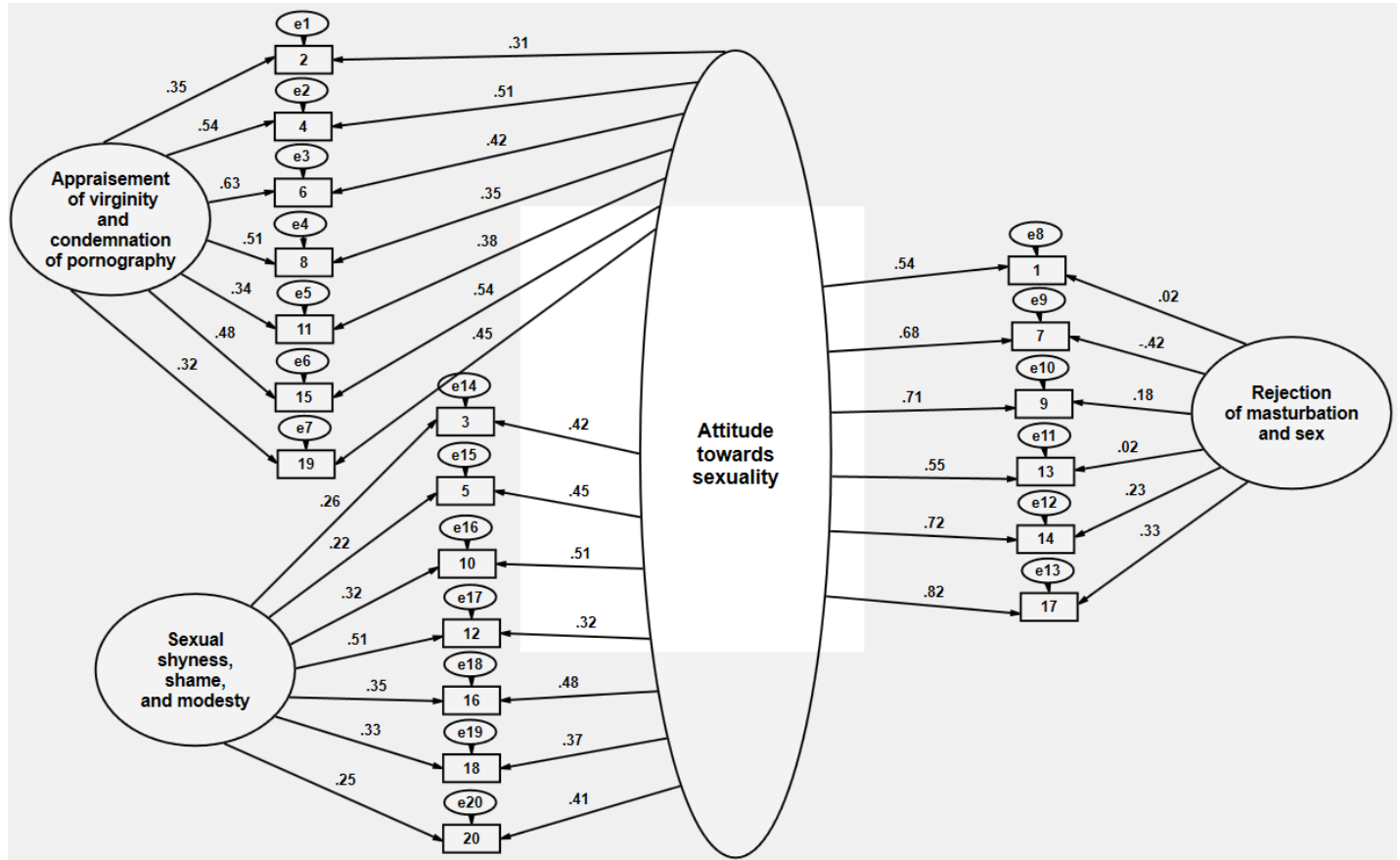


Figure 3. Model with constraints on measurement error variances (ME) for the bifactor model (BM).

(20%) variances of measurement errors. The general factor had higher weight on items 3 ($Z = -6.59, p < 0.001$), 6 ($Z = -3.33, p = 0.001$), 7 ($Z = -3.21, p = 0.001$), 9 ($Z = -2.27, p = 0.023$), 14 ($Z = -2.41, p = 0.016$), and 19 ($Z = -2.01, p = 0.045$) in medical students than in psychology students. On the contrary, the weights of the masturbation factor on items 9 ($Z = 5.15, p < 0.001$) and 13 ($Z = 2.66, p = 0.008$) were higher in psychology students than in medical students. However, the general factor had higher weight on item 17 ($Z = 2.89, p = 0.004$) in psychology students than in medical students. The measurement error variances of item 8 ($Z = -2.13, p = 0.033$) and 13 ($Z = -2.87, p = 0.004$) were higher in medical students than in psychology students. On the contrary, the measurement error variances of items 4 ($Z = 4.41, p < 0.001$) and 15 ($Z = 4.54, p < 0.001$) were higher in psychology students than in medical students.

The goodness of fit of the unconstrained model (UC) was better compared to the other three nested models ($\Delta\chi^2/df > 3, \Delta AIC > 10, \Delta GFI, \Delta AGFI, \Delta CFI, \Delta RFI, \text{ and } \Delta RMSEA > 0.01$). In the model with constraints on measurement error variances (ME), which had the worst fit among the four nested models for the bifactor model, the fit was close through five indices and acceptable

through three (NFI, RFI, and SRMR) (Table 2 and Figure 3). The goodness of fit of the bifactor model (BM-3) was better than that of the single-factor model (1F), but was not clearly differential with respect to the correlated-factor model (CF-3) and the hierarchical model (HM-3), since only one index was differential (ΔAIC) and this was contradictory from one nested model to another.

Taking into account all the properties, the bifactor model (BM-3) was not invariant between the two samples, like the previous hypothetical models. Although it had the best fit to the data, this was not clearly better than the fit of the correlated-factor (CF-3) and hierarchical (HM-3) models. It had non-significant parameters (measurement weights of two specific factors) and presented discriminant validity problems in the content domains of masturbation and sexual shyness, shame and modesty with an excessive contribution of the general factor to the detriment of the specific factor. Consequently, it was not a good model. The hierarchical model (HM-3) shared the same discriminant validity problem between the general higher-order factor and the hierarchical lower-order factor in the domains of masturbation and sexual shyness, shame and modesty as the bifactor model.

The correlated-factor model (CF-3) yields the model with the best properties. All its parameters were significant and its three factors showed convergent and discriminant validity. Its fit in the unconstrained model between both student samples was close through seven indices and acceptable through one, as well as equivalent to that of the other two three-factor models (HM-3 and BM-3) and better than the single-factor model (1F). Even though its fit worsened when parameters were constrained between the two samples, this ranged from good through five indices to acceptable through three in the model with all the constrained parameters (ME), and never was bad. Therefore, it was a good model, but not invariant between psychology and medical students.

Internal consistency reliability

The overall internal consistency reliability was good (ordinal $\alpha = 0.89$; 95% CI: 0.87, 0.90), without difference between both samples ($F[401, 197] = 1.27$; 95% CI: 0.99, 1.61; right tail $p = 0.055$). Also, the reliability of the masturbation factor was good (ordinal $\alpha = 0.84$; 95% CI: 0.82, 0.86) and without difference between both samples ($F[401, 197] = 1.16$; 95% CI: 0.91, 1.47; right tail $p = 0.229$). The reliability of the sexual shyness, shame and modesty factor was acceptable (ordinal $\alpha = 0.70$; 95% CI: 0.66, 0.74) and without difference between both samples ($F[401, 197] = 1.01$; 95% CI: 0.79, 1.28; right tail $p = 0.924$).

Regarding the appraisal of virginity and condemnation of pornography factor, there was a significant difference ($F[401, 197] = 1.39$; 95% CI: 1.08, 1.76; right tail $p = 0.010$). Its reliability was acceptable among psychology students (ordinal $\alpha = 0.79$; 95% CI: 0.76, 0.82) and good among medical students (ordinal $\alpha = 0.85$; 95% CI: 0.82, 0.88). The reliability of this factor in the pooled sample was good (ordinal $\alpha = 0.81$; 95% CI: 0.79, 0.83) (Table 3).

Description of the distribution of the ASS-20 and its three factors

In Table 5, the descriptive statistics and normality tests are presented for the ASS-20 total score and its three factors in both student samples and in the pooled sample. The scores on the ASS-20 and appraisal of virginity and condemnation of pornography factor followed a normal distribution in both student samples and in the pooled sample. The distribution of scores on the rejection of masturbation and sex factor showed positive skewness or long tail to the right in psychology students ($Z_{Sk} = 4.09 > 1.96$), platykurtosis or shortened tails in medical students ($Z_K = -2.04 < -1.96$) and both positive skewness and platykurtosis in the pooled sample ($Z_{Sk} = 4.68 > 1.96$ and $Z_K = -2.25 < -1.96$, respectively);

therefore it did not follow a normal distribution model. Scores on attitude towards sexual shyness, shame and modesty factor showed platykurtosis or shortened tails in psychology students and in the total sample, and thus they also deviated from normality. As in previous cases, the deviation from normality was slight. In medical students, the correlation between the theoretical (t) and empirical (e) quantiles in the normal quantile-quantile plot was unitary ($r_{et} = 0.99$, [0.97, 1.01]), the null hypothesis of normality is maintained with a p value greater than 0.01 with the D'Agostino-Pearson test using D'Agostino et al.'s (1990) population formulas ($K^2 = 7.41$, right tail $p = 0.025$) and er than 0.05 with Fisher's (1930) unbiased formulas ($\chi^2[2] = 4.56$, right tail $p = 0.102$). Its mean ($M = 2.34$; 95% CI: 2.25, 2.43), median ($Mdn = 2.43$), and mode ($Mo = 2.43$, 11.1% of the scores) had very close values, and the histogram profile described a bell-shaped curve; consequently, its approximation to normality was acceptable.

Attitudinal levels and mean differences among factors and between men and women

In the psychology students, the mean on appraisal of virginity and the condemnation of pornography showed an ambiguous attitude ($2.6 < M = 2.92 < 3.4$). The attitudes were liberal in the ASS-20 total score and the other two factors (Table 5). When comparing the means of the three factors, there was a significant difference ($F[1.91, 764.60] = 534.96$, $p < 0.001$; without assuming homogeneity of variances: Mauschly's $W = 0.93$, $\chi^2[2, N = 198] = 14.71$, $p = 0.001$ and using the Greenhouse-Geisser correction for the degrees of freedom). The effect size of each factor on the attitudinal level was very large ($\eta_p^2 = 0.57$ and $\epsilon_p^2 = 0.72 > 0.14$).

Likewise, in the medical students, the mean on appraisal of virginity and the condemnation of pornography showed an ambiguous attitude ($2.6 < M = 2.88 < 3.4$) and the attitudes were liberal in the total score and the other two factors ($1.8 < M < 2.6$) (Table 5). When comparing the means of the three factors, there was a significant difference ($F[1.865, 367.430] = 169.09$, $p < 0.001$; without assuming homogeneity of variances: Mauschly's $W = 0.95$, $\chi^2[2, N = 402] = 20.06$, $p = 0.001$ and using the Greenhouse-Geisser correction for the degrees of freedom). The effect size of each factor on the attitudinal level was very large ($\eta_p^2 = 0.46$ and $\epsilon_p^2 = 0.61 > 0.14$). When making pairwise comparisons by Student's paired t test with the Bonferroni correction for significance level ($\alpha_c = 0.017$), there was a significant difference between the three pairs both in psychology and medical students. The most liberal attitude was towards masturbation and the least liberal was in appraisal of virginity and condemnation of pornography.

When comparing the means in the three factors between both samples by Hotelling's T^2 test, there was a

Table 5. Descriptive statistics and normality tests.

Sta.	Sample of psychology students				Sample of medical students				Pooled sample			
	ASS	VCP	MAS	SSM	ASS	VCP	MAS	SSM	ASS	VCP	MAS	SSM
n	402	402	402	402	198	198	198	198	600	600	600	600
Min	1	1	1	1	1.10	1.29	1	1	1	1	1	1
Max	4.05	5	4	3.86	4.15	5	3.83	3.71	4.15	5	4	3.86
M	2.36	2.92	1.81	2.29	2.43	2.88	2.01	2.34	2.39	2.91	1.88	2.30
(CI)	(2.31, 2.42)	(2.85, 2.99)	(1.75, 1.87)	(2.22, 2.35)	(2.35, 2.52)	(2.77, 2.99)	(1.91, 2.11)	(2.25, 2.43)	(2.34, 2.43)	(2.85, 2.97)	(1.82, 1.93)	(2.25, 2.35)
SD	0.54	0.74	0.61	0.64	0.60	0.81	0.70	0.63	0.56	0.76	0.65	0.64
Tests for normality												
Z _{lb1}	-0.04	-0.17	3.92	-0.54	0.18	1.98	1.80	-1.18	0.28	1.18	4.50	-1.11
Z _{b2}	-1.73	-0.51	-1.69	-3.80	-1.66	-0.31	-3.02	-2.45	-2.26	-0.71	-2.86	-4.75
K ²	2.98	0.29	18.25	14.73	2.79	4.03	12.36	7.41	5.16	1.88	28.42	23.82
p	0.225	0.865	<0.001	0.001	0.248	.133	0.002	0.025	.076	0.391	<0.001	<.001
Z _{Sk}	-0.04	-0.16	4.09	-0.54	0.18	1.99	1.81	-1.17	0.28	1.17	4.68	-1.11
Z _K	-1.49	-0.58	-1.46	-2.62	-1.37	-0.41	-2.04	-1.78	-1.89	-0.73	-2.25	-3.21
χ ²	2.21	0.35	18.87	7.12	1.90	4.15	7.41	4.56	3.63	1.91	27.02	11.54
p	0.331	0.838	<0.001	0.028	0.387	0.125	0.024	0.102	0.163	0.385	<0.001	0.003
r _{et}	0.997	0.998	0.973	0.992	0.996	0.992	0.981	0.992	0.997	0.997	0.975	0.992
(CI)	(0.989, 1)	(0.991, 1)	(0.951, 0.996)	(0.980, 1)	(0.983, 10.01)	(0.975, 10.01)	(0.953, 10.01)	(0.973, 10.01)	(0.992, 1)	(0.991, 1)	(0.958, 0.993)	(0.982, 1)
Percentiles												
P10	1.65	2	1	1.33	1.60	1.86	1	1.43	1.65	1.86	1	1.43
P20	1.85	2.29	1.17	1.71	1.90	2.14	1.33	1.71	1.85	2.29	1.17	1.71
P25	1.94	2.43	1.33	1.86	2	2.29	1.50	1.86	1.95	2.43	1.33	1.86
P30	2.05	2.57	1.33	1.86	2.10	2.43	1.50	2	2.05	2.43	1.50	1.86
P40	2.25	2.71	1.50	2.14	2.23	2.57	1.67	2.14	2.25	2.71	1.67	2.14
P50	2.40	3	1.67	2.29	2.40	2.86	2	2.43	2.40	2.86	1.83	2.29
P60	2.55	3.14	2	2.43	2.62	3	2.17	2.57	2.55	3.14	2	2.57
P70	2.66	3.29	2.17	2.71	2.80	3.29	2.50	2.71	2.70	3.29	2.17	2.71
P75	2.75	3.43	2.33	2.71	2.90	3.43	2.54	2.86	2.80	3.43	2.33	2.71
P80	2.85	3.57	2.33	2.86	3	3.57	2.67	2.89	2.90	3.57	2.50	2.86
P90	3	3.86	2.67	3.14	3.20	4	3	3.14	3.10	3.99	2.83	3.14

Sta. = Statistic: n = sample size, Min = sample minimum value, Max = sample maximum value, M (CI) = point estimation for mean and 95% confidence interval based on the Student's t-distribution, SD = sample standard deviation. Tests of normality: Z_{lb1} = standardized population coefficient of skewness using D'Agostino transformation to normality, Z_{b2} = standardized population kurtosis using Anscombe-Glynn transformation to normality, K² = test statistics calculated through the formulas of D'Agostino et al. (1990), p = right tail probability value under null hypothesis of normal distribution, Z_{Sk} = standardized value of Fisher's sample coefficient of skewness. Z_K = standardized value of Fisher's sample coefficient of kurtosis, χ² = D'Agostino-Pearson test statistics calculated through Fisher's unbiased formulas, p = right tail probability value under null hypothesis of normal distribution. Normal quantile-quantile plot: r_{et} (CI) = Pearson's product-moment correlation coefficient between empirical quantiles (e) and theoretical (t) quantiles of a standard normal distribution, as well as its 95% confidence interval based on the Student's t-distribution with n - 2 degree of freedom. It was highlighted in bold when the coefficient or the test shows deviation from normality for a significance level of 0.05. Sample quantiles using linear interpolation of the expectations for the order statistics for the standard uniform distribution [0, 1]: P10 = tenth percentile, P20 = twentieth percentile, P25 = twenty-fifth percentile or first quartile, P30 = thirtieth percentile, P40 = fortieth percentile, P50 = fiftieth percentile, second quartile or median, P60 = sixtieth percentile, P70 = seventieth percentile, P75 = seventy-fifth percentile or third quartile, P80 = eightieth percentile, and P90 = ninetieth percentile. ASS = 20-item Attitude towards Sexuality Scale = Sum(item 1 to item 20)/20, VCP = Appraisement of Virginitiy and Condemnation of Pornography = (item 2 + item 4 + item 6 + item 8 + item 11 + item 15 + item 19)/7, MAS = Rejection of Masturbation and Sex (item 1 + item 7 + item 9 + item 13 + item 14 + item 17)/6, SSM = Sexual Shyness, Shame, and Modesty = (item 3 + item 5 + item 10 + item 12 + item 16 + item 18 + item 20)/7.

significant difference ($T^2 = 22.54$, $F[3, 594] = 7.49$, $p < 0.001$; assuming homogeneity of covariances between both samples by Box's M test: $M = 10.489$, $F[6, 1021, 920.86] = 1.74$, $p = 0.108$). When making pairwise comparisons, the mean attitude towards masturbation was significantly higher in medical students than in psychology students ($MD = -0.21$; 95% CI: $-0.36, -0.05$). In the other two factors, the difference was not significant.

The multivariate distribution of the three factors presented mesokurtosis by the Mardia statistic both in the sample of psychology students ($b_2 = 14.95$, $Z_{b_2} = -0.10$, two tail $p = 0.921$) and medical students ($b_2 = 14.22$, $Z_{b_2} = -0.01$, two tail $p = 0.994$) as in the pooled sample ($b_2 = 14.57$, $Z_{b_2} = -0.964$, two tail $p = 0.335$). It also presented symmetry in the sample of psychology students ($U[3] = 4.70$, right tail $p = 0.195$, $Z_U = 0.87$ with the Wilson-Hilferty transformation of a chi-square variable to normality), but it showed very slight skewness in the sample of medical students ($U[3] = 9.77$, right tail $p = 0.021$, $Z_U = 2.04$) and in the pooled sample ($U[3] = 9.08$, right tail $p = 0.028$, $Z_U = 1.91$). By multivariate version of Jarque-Bera test ($\chi^2[3+1 = 4] = U + Z_{b_2}^2$), the null hypothesis of multivariate normality would hold in the sample of psychology students with a significance level of 0.05 ($\chi^2[4] = 4.71$, right tail $p = 0.318$). In the sample of medical students ($\chi^2[4] = 9.77$, right tail $p = 0.044$) and in the pooled sample ($\chi^2[4] = 10.01$, right tail $p = 0.040$), the 95% confidence level should be increased to 96% to maintain the null hypothesis of normality. If the test statistic is calculated using the Wilson-Hilferty transformation to normality applied to the chi-square statistic of skewness ($\chi^2[2] = Z_U^2 + Z_{b_2}^2$), the assumption of multivariate normality would hold in all three samples ($\chi^2[2] = 0.76$, right tail $p = 0.684$ in psychology students, $\chi^2[2] = 4.18$, $p = 0.124$ in medical students, and $\chi^2[2] = 4.59$, $p = 0.101$ in pooled sample). Consequently, there was a good approximation to multivariate normality as required by the Hotelling's T^2 and Box's M tests.

Concurrent validity in relation to the attitude towards gay men

The AHS-10 was only administered in the sample of psychology students. Its mean ($M = 2.24$; 95% CI: $2.17, 2.31$) and median ($Mdn = 2.20$) overlapped, reflecting an attitude of acceptance [$1.8, 2.6$). The distribution of AHS-10 total scores was mesokurtic ($Z_K = 0.55$), but was skewed slightly to right ($Z_{Sk} = 3.48$), and thus it did not adjust to normality (D'Agostino $K^2 = 11.93$, right tail $p = 0.003$; with Fisher's unbiased formulas: $\chi^2[2] = 12.44$, $p = 0.002$). However, the correlation between the theoretical (t) and empirical (e) quantiles in the normal quantile-quantile plot was unitary ($r_{et} = 0.997$; 95% CI: $0.989, 1.005$) and the histogram profile described a bell-shaped curve. Consequently, the distribution of AHS-10 total scores approached a normal distribution.

ATG-S was administered only in the sample of medical students. Its mean ($M = 4.62$; 95% CI: $4.35, 4.89$) and median ($Mdn = 4.60$) overlapped, reflecting an ambiguous attitude [$4.2, 5.8$). The histogram profile described a bell-shaped curve. The distribution of ATG-S total scores was symmetric ($Z_{Sk} = 0.73$) and mesokurtic ($Z_K = -1.69$), and followed to normal distribution (D'Agostino $K^2 = 5.65$, right tail $p = 0.059$; with Fisher's formulas: $\chi^2[2] = 3.39$, right tail $p = 0.183$). The correlation between the theoretical (t) and empirical (e) quantiles in the normal quantile-quantile plot was unitary ($r_{et} = 0.99$; 95% CI: $0.98, 1.01$). Consequently, the distribution of ATG-S total scores followed a normal distribution. Table 6 shows the correlations between ASS-20 and the two scales of attitude towards male homosexuality. All the correlations were significant, direct, and statistically equivalent between both samples. The strength of the association of the ASS-20 and its first two factors was medium with the two scales of attitude towards homosexuality; on the other hand, strength of the association of the sexual shyness, shame and modesty factor was small; the greater the rejection of sexuality, the greater the rejection of gay men.

When comparing the four correlations within the sample of psychology students, considering the Bonferroni's correction for the significance level due to multiple comparisons ($\alpha = 0.05/6 = 0.0083$), the correlation of AHS-10 with the ASS-20 total score was significantly higher than with the VCP and SSM factors (Steiger's $Z = 2.79$, two tail $p = 0.005$; and Steiger's $Z = 4.85$, two tail $p < 0.001$, respectively). There was no significant difference between the correlations of three factors with AHS-10 (Table 7). Within the sample of medical students, the correlation of ATG-S with SSM was significantly lower than with the ASS-20 total score (Steiger's $Z = 4.87$, two tail $p < 0.001$) and with the VCP factor (Steiger's $Z = 3.11$, two tail $p = 0.002$) (Table 7). Additionally, the correlation of AHS-10 or ATG-S with MAS would be significantly higher than with SSM in each of the samples, but without the Bonferroni's correction (Steiger's $Z = 2.58$, two tail $p = 0.010$ in psychology students; and Steiger's $Z = 2.407$, two tail $p = 0.016$ in medical students) (Table 7).

DISCUSSION

Factor structure of ASS-20

The first objective of the study was to verify whether the three-factor model proposed by Moral and Ortega (2008) was valid in psychology and medical students and even invariant across the two types of students. Previously, only a correlated-factor model had been tested (Moral and Ortega, 2009). In this study, two additional models are specified that theoretically justify the calculation of a total score, apart from the factor scores. On the one

Table 6. Correlation of the ASS-20 and its three factors with the two attitude scales towards gay men.

Scales	AHS-10 (n = 402)	ATG-S (n = 198)	Z	p
ASS-20	0.427*** [0.344, 0.504]	0.476*** [0.361, 0.577]	-0.705	0.481
VCP	0.351*** [0.262, 0.434]	0.483*** [0.369, 0.583]	-1.835	0.067
MAS	0.404*** [0.319, 0.483]	0.420*** [0.298, 0.528]	-0.221	0.825
SSM	0.289*** [0.197, 0.376]	0.282*** [0.149, 0.405]	0.087	0.930

ASS = 20-item Attitude towards Sexuality Scale, VCP = Appraisal of Virginity and Condemnation of Pornography, MAS = Rejection of Masturbation and Sex, and SSM = Sexual Shyness, Shame and Modesty, AHS-10 = 10-item Attitude towards Homosexuality Scale, ATG-S = Attitude of Subtle rejection Towards Gay Men. The 95% confidence intervals for the Pearson product-moment correlation coefficients were calculated using the Fisher's transformation. Significance level in a two-tailed test: $p \leq 0.001$.

Table 7. Comparison of the correlations within each sample through the Steiger's Z test.

Psychology students			Medical students		
$r_{12} - r_{13}$	Z	p	$r_{12} - r_{13}$	Z	p
$r_{(AHS-10, ASS-20)} - r_{(AHS-10, VCP)}$	2.792	0.005	$r_{(ATG-S, ASS-20)} - r_{(ATG-S, VCP)}$	-0.213	0.832
$r_{(AHS-10, ASS-20)} - r_{(AHS-10, MAS)}$	0.777	0.437	$r_{(ATG-S, ASS-20)} - r_{(ATG-S, MAS)}$	1.645	0.100
$r_{(AHS-10, ASS-20)} - r_{(AHS-10, SSM)}$	4.850	< 0.001	$r_{(ATG-S, ASS-20)} - r_{(ATG-S, SSM)}$	4.870	< 0.001
$r_{(AHS-10, VCP)} - r_{(AHS-10, MAS)}$	-1.126	0.260	$r_{(ATG-S, VCP)} - r_{(ATG-S, MAS)}$	1.127	0.260
$r_{(AHS-10, VCP)} - r_{(AHS-10, SSM)}$	0.952	0.341	$r_{(ATG-S, VCP)} - r_{(ATG-S, SSM)}$	3.113	0.002
$r_{(AHS-10, MAS)} - r_{(AHS-10, SSM)}$	2.579	0.010	$r_{(ATG-S, MAS)} - r_{(ATG-S, SSM)}$	2.407	0.016

ASS-20 = 20-item Attitude towards Sexuality Scale, VCP = Appraisal of Virginity and Condemnation of Pornography, MAS = Rejection of Masturbation and Sex, and SSM = Sexual Shyness, Shame and Modesty, AHS-10 = 10-item Attitude towards Homosexuality Scale, ATG-S = Attitude of Subtle rejection Towards Gay. Significant correlations with a significance level of 0.05 after applying the Bonferroni correction are highlighted in bold ($\alpha_c = 0.05/6 = 0.0083$), and without this correction ($\alpha = 0.05$) are highlighted in italics.

hand, there is the bifactor model in which each item is directly determined by a general factor of attitude towards sexuality and one of the three specific factors (Domínguez-Lara and Rodríguez, 2017; Reise, 2012). On the other hand, there is the hierarchical model in which each item is directly determined by one of the three hierarchical lower-order factors and indirectly by the general higher-order factor of attitude towards sexuality (lower-order submodel); in turn, the three hierarchical lower-order factors are directly determined by the general higher-order factor (higher-order submodel) (Brunner et al., 2012).

The bifactor model was expected to present the best fit and invariance properties between both types of students (Cucina and Byle, 2017; Reise, 2012). Furthermore, its three specific factors were also expected to have convergent and discriminant validity. This expectation was not fulfilled. Its goodness of fit was equivalent to the correlated-factor model. It had some non-significant parameters and showed discriminant validity problems with an excessive weight of the general factor to the detriment of the specific factor on the six masturbation items and on the seven items of sexual shyness, shame and modesty. Consequently, it was a bad model. The

hierarchical model also showed discriminant validity problems with a poor hierarchical factor effect on the six masturbation items and on the seven sexual shyness, shame and modesty items. The correlated-factor model was the best model. Its goodness of fit was equivalent to the bifactor and hierarchical models, and showed convergent in its three factors and discriminant validity between them.

When stating that the correlated-factor model better represents the interrelation between the 20 items, the calculation of a total score is not theoretically justified as in the bifactor and hierarchical models. The justification for its calculation becomes merely practical, based on the positive interrelation between the factors, as well as on its usefulness, such as having cut-off points to classify people in ordered categories (liberal, ambiguous, and conservative attitude). The unconstrained model for correlated-factor model had the best fit compared to the other nested models, which was close, and had parameters with significant differences between both samples, as it also happened with the bifactor and hierarchical models. Therefore, it is a valid model for both types of students, but not invariant. What differences does the correlated-factor model show?

Masturbation is more frequently defined in terms of “mental dirt” (item 13) among psychology students than among medical students; on the other hand, masturbation is also frequently defined in terms of a psychopathological phenomenon (item 9) and practice that deteriorates health (item 17) among medical students than among psychology students. Another difference is that the positive linear association between the masturbation factor and the appraisal of virginity and condemnation of pornography factor was stronger among medical students than among psychology students (six tenths of the explained variance versus four tenths). Moreover, the importance given to remain virgin until marriage (item 6), to assume that premarital sex is immoral (item 15) and to consider pornography as a corrupting influence to mind (item 19) are more defined indicators of the appraisal of virginity and condemnation of pornography among medical students than among psychology students. Another difference is that the sexual shyness, shame and modesty factor had lower variability (more uniformity) among medical students than among psychology students.

Reliability of ASS-20 and its factors

The second objective of the study was to estimate the internal consistency reliability of ASS-20 and its three factors. In accordance with expectations (Moral and Ortega, 2008, 2009), the level of overall internal consistency reliability in the pooled sample was good, and it was also so for the first two factors (the factor that assesses appraisal of virginity and condemnation of pornography, and the other one related to rejection of masturbation and sex). There was no difference between both samples in the internal consistency values of the scale and the first factor (appraisal of virginity and condemnation of pornography); there was a difference in the second factor (rejection of masturbation and sex), which showed higher internal consistency among medical students (good) than among psychology students (acceptable). This higher consistency, together with the more defined weights of items 9 (masturbating is for sick minds) and 17 (masturbation is bad), indicate that the image of masturbation as a psychopathological phenomenon is widely shared among medical students. Also, according to expectations, the factor with the lower internal consistency, at an acceptable level, was sexual shyness, shame, and modesty. As it was the case for the scale and the first factor, this third factor did not show any significant difference between both samples.

Distributions and averages of the scores on ASS-20 and its factors

The third objective of this study was to describe the

distributions of scores on ASS-20 and its three factors. According to expectations (Moral and Ortega, 2009), the scores on the scale and the factor for assessing appraisal of virginity and condemnation of pornography followed a normal distribution. The other two factors deviated slightly from normality. In the case of the factor related to rejection of masturbation and sex, the deviation was due to slight skewness with a long tail to the right (majority of cases on the liberal pole, with a few cases, very distant from each other, on the conservative pole) among psychology students and in the pooled sample; among medical students, this skewness was due to slight platykurtosis (lower number of cases in the tails than the expected for a normal distribution). This higher number of cases in the central area (between the two shoulders or points of inflection) than that corresponding to a normal distribution, together with the symmetry of a bell-shaped curve profile, reflects a very representative mean, which is significantly higher among medical students than among psychology students, and reflects a less liberal attitude. In addition, the higher internal consistency, the higher measurement weights, and the smaller measurement residuals in the masturbation factor among medical students than among psychology students show a great homogeneity in this attitudinal aspect among medical students. In the case of the factor of sexual shyness, shame, and modesty, the deviation from normality was due to platykurtosis in the pooled sample and in each one of the two student samples. However, leptokurtosis was very slight among medical students, only detectable with the Anscombe-Glynn transformation, but not with the Fisher's unbiased estimators, thus allowing to support the null hypothesis of normal distribution by the three statistical tests (K^2 with population or unbiased statistics and normal Q-Q plot) among medical students.

It should be noted that these deviations from normality in the scores of the last two factors of the ASS-20 are mild, so that there is a good approximation to multivariate normality. Consequently, these distributions show that there is freedom in the attitudinal expression of these young university students (Lyon, 2013). Their attitudes are determined by multiple factors with linear effects, and none of these factors has an excessive weight that could skew and concentrate the scores on the scale and distort the bell-shaped curve profile corresponding to the normal probability law (Frank, 2009; Gould, 2002).

The average attitude was liberal both on the scale as well as on the factor related to rejection of masturbation and sex and on the factor related to sexual shyness, shame, and modesty, such as it has been reported previously in other studies in the population of university students (Moral and Ortega, 2008; Menshawy et al., 2020; Salameh et al., 2016). Nevertheless, the average valuation in the appraisal of virginity and condemnation of pornography was in the range of ambiguity in both samples of students. The averages

were differential between the three factors within each sample. These attitudinal levels can be ordered according to the level of liberality in the following sequence: attitude towards masturbation, attitude towards nudity and carnality, and attitude towards virginity and pornography. The fact that the attitude towards the appraisal of virginity and the condemnation of pornography is the least liberal aspect is concordant with studies about sociohistorical premises in Mexico (Velasco-Moncada and Hernández-González, 2017; Díaz-Loving et al., 2015) and Latin America (Alarcón, 2005). These studies show that female virginity, until the wedding night, is one of the existing and still valued socio-historical premises in Latino culture.

The most liberal average appeared in the attitude towards masturbation, and this attitude was significantly more liberal among psychology students than among medical students. There was also a significant difference in the attitude towards gay men, which was liberal among psychology students and ambiguous among medical students. These differences could be attributed to the depathologization of both sexual behaviors in the scientific-academic context outside the non-psychoanalytic paradigms (Frank, 2016; Regnerus et al., 2017). Nevertheless, the classification of these behaviors as perverse still persists within the classical psychoanalytic currents, as in Freudian, Kleinian, and Lacanian schools (Frank, 2016; Kunzel, 2020). Precisely, these psychoanalytic currents originate and prevail in the medical-psychotherapeutic field (Paris, 2017), while cognitive-behavioral, constructivist, and psychosocial currents, which conceptualize both sexual behaviors as natural, prevail in the different fields of psychology (David et al., 2018).

Concurrent validity of ASS-20 regarding male homosexuality

The fourth objective of this study was to verify convergent validity of ASS-20 in relation to the attitude towards male homosexuality. The expectation was to find a positive and significant association, with no difference between both samples/scales (Moral and Valle, 2014), and this expectation was met. According to the content, the strength of association of the two scales of attitude towards homosexuality varied from medium (with the ASS-20 total score and the first two factors) to small with the third factor (sexual shyness, shame and modesty). The two most related aspects were the appraisal of virginity and condemnation of pornography and the subtle rejection of male homosexuality, with almost a quarter of shared variance. As previously mentioned, this factor reflects the more culturally conservative aspect of ASS-20. It should be noted that homosexuality has traditionally been rejected in Western culture and only in recent decades has a change occurred (Redman, 2018). First,

this change was towards their tolerance and, progressively, towards their acceptance as a natural and valid expression of sexual orientation (Kite and Bryant-Lees, 2016); thus, the rejection is essentially subtle, symbolic, or overlapped.

In the present study we chose to measure the attitude towards gay men, since the adaptation of the ATLG in Mexico (Moral and Valle, 2011) allowed us to define a subtle rejection factor and because the rejection towards homosexuality in men is a more ingrained cultural aspect (Kite and Bryant-Lees, 2016). Nevertheless, the rejection towards gay men and towards lesbians is strongly related (Moral and Valle, 2011), hence it should not make a big difference if the Attitude Toward Lesbian Scale (ATL) is used to assess concurrent validity.

Study limitations

We used an incidental non-probability sampling, and thus the conclusions should be taken with due caution. There are no paired data of the participants in a short term (days or weeks) or a medium (months) or long term (years); consequently, the temporal reliability and factor model stability could not be tested. The design was non-experimental, hence we only could talk about associations between attitudes, and we could not make any causal inference.

Conclusion

Among these Mexican students of psychology from a public university and among these medical students from a private university, the model composed of three correlated factors that was originally proposed shows a close fit, convergent validity in each factor, and discriminant validity between its factors. Nevertheless, it is not invariant across the two types of students. Items 6, 15, and 17 are better explained (higher weight and lower residual) by their corresponding factor, and items 9 and 19 have a greater measurement weight among medical students than among psychology students. These five items belong to the factors related to the appraisal of virginity and condemnation of pornography and to the factor related to rejection of masturbation and sex, which show a higher correlation among medical students than among psychology students. Among psychology students, item 13 (sex is dirty) is better explained by its factor (rejection of masturbation and sex) than among medical students. The level of internal consistency reliability of ASS-20 and its first factor (appraisal of virginity and condemnation of pornography) are good, whereas it was acceptable for the factor related to sexual shyness, shame, and modesty, without any significant difference between both samples. There is a significant difference in the level of reliability of the second factor

(rejection of masturbation and sex); its level is good among medical students and acceptable among psychology students. Scores on ASS-20 and the factor related to the appraisal of virginity and condemnation of pornography follow a normal distribution. The deviations from normality in the other two factors are very mild, so that there is a good approximation to multivariate normality. The average attitude, interpreted in an absolute sense, is liberal, except for the appraisal of virginity and condemnation pornography, which is ambiguous. The only difference in means between the two samples is the more liberal attitude towards masturbation among psychology students than among medical students. ASS-20 shows convergent validity in relation to the attitude towards male homosexuality, assessed with two different instruments. The correlation of those two instruments with the ASS-20 total score and its first two factors are medium, whereas the correlation with the third factor is low; there are no differences in these correlations between both samples or both scales of attitude towards homosexuality.

Recommendations

The use of this scale is recommended to assess and study the attitude towards sexuality in Mexican health science university students. ASS-20 can be scaled using the mean and standard deviation estimated through a probability sampling method. Likewise, the study of ASS-20 is suggested at the levels of compulsory secondary school and high school, as well as among university students of other careers. Additionally, the factorial invariance across sexes, age groups, or levels of schooling should be tested. From the present data, it can be inferred that, by promoting virginity and the condemnation of pornography (cultural values that still pervade our society), rejection towards homosexuality is being encouraged, especially the implicit type of rejection; these two aspects are not independent and have a rather close association (almost a quarter of shared variance).

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ABBREVIATIONS

ASS-20, Twenty-item Attitude towards Sexuality Scale; **AHS-10**, Ten-item Attitude towards Homosexuality Scale; **ATG-S**, Subtle rejection Attitude Towards Gay men subscale from the Mexican adaptation of Attitudes Towards Lesbians and Gay men (ATLG) scale; **MAS**, ASS-20 rejection of Masturbation and Sex factor; **SSM**, AAS-20 sexual shyness, shame, and modesty factor;

VCP, AAS-20 appraisalment of Virginity and Condemnation of Pornography factor.

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ANNEX**20-item Attitude towards Sexuality Scale (ASS-20)**

Indicate the degree to which you agree with the following statements, circling the option that best describes your way of feeling or thinking. The options are ordered from Strongly Disagree (SD) to Strongly Agree (SA).

SD Strongly Disagree

D Disagree

nAnD Neither Agree nor Disagree

A Agree

SA Strongly Agree

	SD	D	nAnB	A	SA
1. When I masturbate, I try or think about it; I feel a lot of guilt	1	2	3	4	5
2R. Pornography is a cultural and artistic expression worthy of respect.	5	4	3	2	1
3. I am very ashamed when talking about sex	1	2	3	4	5
4R. You can have premarital sex if you take the appropriate precautions	5	4	3	2	1
5. I would only have sex with the light off	1	2	3	4	5
6. It is important to stay a virgin until marriage	1	2	3	4	5
7. Thinking about sex causes me great anguish	5	4	3	2	1
8R. Virginity is an unimportant value to me	5	4	3	2	1
9. Masturbating is for sick minds	1	2	3	4	5
10R. I would watch a pornographic movie	5	4	3	2	1
11. It is a moral virtue to resist the temptation of carnal desire	1	2	3	4	5
12R. I would go to a nude beach	5	4	3	2	1
13. Sex is dirty	1	2	3	4	5
14R. Masturbation is normal and pleasant	5	4	3	2	1
15. Premarital sex is immoral	1	2	3	4	5
16R. The naked body is beautiful	5	4	3	2	1
17. Masturbation is bad	1	2	3	4	5
18R. Sex is an important source of pleasure in life	5	4	3	2	1
19. Pornography corrupts the mind	1	2	3	4	5
20R. I like to learn about any topic of sexuality	5	4	3	2	1

Note. R = reverse-keyed item or worded in a liberal sense in this scale of rejection towards sexuality. The table indicates how to rate the items from 1 to 5.

Full Length Research Paper

Relationship between participation motives and connection to soccer of male university players

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Received 21 July, 2020; Accepted 12 October, 2020

Participation in physical activity or sport has numerous benefits. This is more apt at the university level where students pursue multiple roles. However little is known on the participation motives and extent of connection (attachment) to different sport codes at the university level. The purpose of the study was to examine the relationship between participation motives and connection to soccer of male university players. It was predicted that participation motives and connection to soccer would not be mediated by selected demographic factors of birth rank and level of study. Data was collected through self-administered questionnaires from male university soccer players (n=242) who were taking part in a university soccer championship. Data was analyzed through descriptive statistics of percentages and means, while inferential statistics of one ANOVA was used to test for differences. The major motives for participation in soccer were to develop physical skills and abilities, keeping in shape and interaction with others with significant differences ($p < 0.05$) based on birth ranks and year of study. Most of the soccer players were highly connected to soccer through attraction, identity affirmation and centrality with no significant differences ($p > 0.05$) attributed to level of study and birth ranks. Study recommends that coaches and team trainers need to take stock of the players motives as they schedule training and competition. They should also explore ways and means of ensuring that soccer players are networked for continued participation.

Key words: Participation, motives, connection, university, soccer.

INTRODUCTION

Participation in physical activity or competitive sport at university level is believed to have numerous sociological, psychological, health, economic, and academic benefits (Greendorfer, 2002; Diehl et al., 2018). Consequently,

participation in sports is highly encouraged and occupies a huge part of university budget. This comes in form of travel, sports infrastructure, human resource and scheduled competitions at national, regional and global

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level. Indeed, some of the universities in Kenya market their academic programs through sports excellence and investment in specific sports. For example, some universities have partnered with high schools and they admit students specifically for sport participation and formation of strong athletic teams. Other universities have availed athletic scholarships for students to boast their performance in sport competitions (Rintaugu et al., 2011).

However, the endless debate is whether universities should continue spending resources on the few university students who take part in sport at the expense of academic programs where all students are involved. This comes from the background that majority of university students are not involved in physical activities (PA) more so sport competitions (Suminski et al., 2002; Ajowi et al., 2016). This view is buttressed in epidemiological evidence which indicate that the level of PA decline from high school to college and activity patterns in college population are generally insufficient to improve their health and fitness (Kilpatric et al., 2005).

In Kenya, just like other parts of the world, soccer is a very popular sport starting from the primary schools to universities. Indeed, some of the university athletes not only play soccer for their university teams, but also for outside clubs and the national team. It is interesting to unearth the motivational factors of the university soccer players as they pursue excellence in both academic pursuits and soccer. Motivation in sport refers to those psychological processes that trigger the arousal, direction and persistence of behavior (Nevid, 2012). Motivation is considered critical to sport participation and performance because it demonstrates the intention, activation and regulation of driving force of behavior (Ryan and Deci, 2001). Broadly speaking, motivation for sport participation can be categorized into two broad areas of intrinsic and extrinsic motivation (Diehl et al., 2018). Intrinsically motivated participants will take part in sport activities for pleasure, fun or other self-determined reasons such as enjoyment, satisfaction and health. Extrinsic factors for sport participation may include benefits such as tangible and materials such as travel, money or social rewards (prestige, recognition). Vallerand and Loiser (1999) opined that if the reasons for sport participation are intrinsic then positive results such as adherence and commitment can be obtained. On the other hand, Garcia-Mas et al. (2010) contends that extrinsic motivation has a higher contribution to enjoyment whereas intrinsic motivation has a higher contribution to commitment.

Another important framework related to motivation in soccer is connection. Connection refers to the extent to which the player feels that soccer has become part of his/her life. The five facets of connection include attraction, identity affirmation, identity expression, centrality and social bonding (Kyle et al., 2007). Once the athletes are connected to soccer this will impact on their athletic identity and sport commitment. Sport commitment

zeroes down to the wish and decision of maintaining participation in sport (Scanlan et al., 1993). It is determined by the degree of sport enjoyment obtained through participation, involvement opportunities derived from participation, social constraints support and/or pressures and the impact of the perceived involvement alternatives to sport. It would thus appear that connected soccer athletes would have their participation motives highly visible and salient. It may also be assumed that connected athletes may not be able to shift their allegiance away from soccer and they will remain committed and would go out of their way to seek excellence in soccer performance.

In navigating these two concepts of participation motivation and connection to soccer, it was presumed that the birth rank and level of study of the player's would influence the relationship between the two concepts. Socio-psychological literature reveals that middle-borns are over-represented in sport competitions (Udoh, 1997; Rintaugu, 2005). Other studies have reported that first-borns are less likely than last born to participate in sport considered dangerous such as hockey and football (McPherson et al., 1989). Consequently, it was apt to predict that the participation motives and connection to soccer will decline as athletes advance in their university studies. This is not remote as first year students have many challenges as they are try to settle down in campus life, away from their parents, lost fame from high school and discrimination by the older students (Kyle et al., 2007; Njororai, 2010). The transition to university life is a process marked by a variety of significant change. For example, university life creates a shift in routine and habits in environments that were previously secure and predictable in which there was a sense of control (Bray and Born, 2004). Indeed, Wood (2011) opines that university athletes are faced with increased stress and a new set of responsibilities as they move away from home leaving some decisions to be made without parental influences. Understanding motivation and connection of soccer athletes is critical to the development of sport careers and will enable stakeholders to provide meaningful assistance as well as create an appropriate enabling environment.

LITERATURE REVIEW

Numerous studies have been conducted on motivation and connection to intramurals, physical activity and sport participation but the findings are inconsistent and inconclusive. For example, Ryan et al. (1997) investigated whether students' initial motivation usually predicted individual attendance and adherence to that particular sport and found that individuals who were mainly motivated by competence and enjoyment were primarily motivated intrinsically. They further reported that several other factors could play a role in individual choices of

sport including intrinsic and extrinsic motives.

In a related study, Vlachopoulos et al. (2000) examined self-determination perspectives related to sport motivation in a diverse sample of college athletes and non-athletes and explored relationships between identified motivational profiles and quality of participant motivational outcomes in sport. It was found that athletes had low extrinsic motivation with high intrinsic motivation and having both extrinsic and intrinsic motivation. In another study, Wilson et al. (2004) noted that the most important motivational factors for sport participation among males and females were affiliation, fitness, skill development and friendship. Kilpatrick et al. (2005) in their study on the motives for participants versus exercisers among college students indicated that participants were more likely to report intrinsic motives such as enjoyment and challenge for engaging in sport whereas motivation for exercisers were more extrinsic and focused on appearance, weight and stress management. This is replicated in Zaharidis et al. (2006) findings on the six participation motives of skill development and competition, status/recognition energy release, team atmosphere friendship and having fun through social interactions and fitness in a related study, Kondric et al. (2013) examined the differences in motivation to participate in sport activities among sports science students from three different countries (Slovenia, Croatia and Germany) and found that the student motives consisted of friendship, popularity, fitness and health, social status, sport events and relaxation. Similarly, Diehl et al. (2018) found that the reasons for participation in university sport and physical activity among university students in Germany were life balance, fun and pleasure and contact with others.

A number of studies on motivational factors and sport participation have been carried out in Africa with diverse results. For example, in Nigeria, Ipinmoroti (2011) found that skill development, psychological well-being, physical fitness and social relationships were reported as important purposes of participation in competitive sport among Nigerian college athletes. Similarly, Omoregie and Obajimi (2011) investigated the extent to which motives for sports participation predicted motivation outcomes of university athletes in track and field events and found that ammotivation emerged as a strong negative outcome measure. In South Africa, Van Heerden (2014) explored the relationship between motivation drivers and sport participation among university sport science students and found a negative correlation between intrinsic and extrinsic motivation. From the above studies it appears that participation in sport seems to be attractive to students due to fun, enjoyment, improving skills, learning, being with friends, success, winning and health (Gaston-Gayles, 2005; Waldron and Dieser, 2010).

In Kenya, a number of studies on motivation in sport among university students have been carried out but the findings are inconclusive (Gitonga et al., 2003; Gitonga et

al., 2011; Rintaugu and Ngetich, 2012; Rintaugu et al., 2014; Ajowi et al., 2016). For example, Gitonga et al. (2003) examined participation motives among university athletes and found that participation motives differed based on gender, type of sport and level of experience. Gitonga et al. (2011) study involving women volleyball players (some teams had university students) in Africa found that their continued participation in volleyball was due to success, personal development, desire to excel and career opportunities. However, the study involved women players only and a few isolated players were university students. Rintaugu and Ngetich (2012) reported that the main motives for sport science students' participation in physical activities were weight management, enjoyment and revitalization while the least motivators were stress management and competition. These motives varied based on the gender of the respondents. Rintaugu et al. (2014) reported that 90% of university athletes joined sport due to enjoyment and their continued participation was due to success. Finally, Ajowi et al. (2016) investigated the participation motives of Kenyan female soccer players and found that the primary motives for participation were to improve skills, physical fitness and team spirit. However, the motives did not differ based on female soccer player's age, sport experience and year of study. Based on the review of previous studies it is apparent a lot has been done on motives for sport participation. However, there is a lacuna as none of the studies has focused on the nexus between motivation and the extent of connection to soccer. Thus, the purpose of the study was to examine relationship between participation motivation and connection to soccer of university athletes. This was apt as university sport administrators need to structure training/competition in line with participation motivation and connection to soccer. The soccer player's in Kenyan universities cannot be treated as a homogenous group and therefore it was apt to predict that their participation motives and connection to soccer will be mediated by their level of study and birth positions.

MATERIALS AND METHODS

Study design and Sample

A descriptive survey design was used to collect data from 242 student-athletes who were taking part in a Kenya university sports association (KUSA) soccer championship. This comprised of 73 (30.16%) fourth year students, 70 (28.9%), second year 65 (26.9%) third year 30 (12.4%) first years and 4 (1.7%) fifth years. In terms of birth ranks, most of the players were middle born 106 (43%), first born 86 (35.5%) and last born 50 (20.7%). As regards duration of play, 93 (38.42%) had played for 3 years, 80 (33.05%) had played for 2 years, 41 (16.94%) for one year, 23 (9.50%) and 5 (2.06%) had played for the university for 4 and 5 years respectively. Regarding family member's participation in soccer, 150 (61.98%) of the family members participated in soccer, while 92 (38.01%) of the family members did not participate in soccer. Among the participants 113 (46.69%) rated soccer as popular in their universities followed by

103 (42.50%) very popular and 26 (10.74%) rated soccer as not popular.

Measures

A self-administered questionnaire was for data collection. The questionnaire had three sections where items in Section A sought demographic information of the participants such as age, birth rank, level of study, and playing experience, while Section B sought information on participation motives or reasons for taking part in soccer. These were nine items derived from Sport Motivation Scale (SMS) (Pelletier et al., 1995; Martens and Weber, 2002) with subscales that scored motivation on a continuum of self-determination ranging from. These items were weighted in a likert scale of strongly agree to strongly intrinsic motivation to disagree. Section C sought information on their extent of connection to soccer activities. This represents an individual's personal attachment or connection to an activity or product. Respondents were asked to rate the extent to which they agreed with statements related to each dimension of connection. These were 15 items which were scored on a 5point likert scale ranging from 1 (strongly disagree to 5 strongly agree). The instrument had been used in previous studies (Kyle et al., 2007; Wood, 2011). Higher mean scores reflected higher levels of connection to soccer. The instruments were piloted among 23 University volleyball players returning a reliability of 0.78 which was considered adequate for the study.

Data analysis

Data was coded for means, standard deviations and percentages under IBMSS. Data was analyzed through one-way analysis of variance (ANOVA) and post hoc test of Tukey Honestly Significant Differences (HSD) to trace the sources of significant differences at 0.05 level of significance. Correlation of coefficient was computed to establish the relationship between participation motivation and connection to soccer.

RESULTS

The means and standard deviations on motives and connection to soccer are presented in Tables 1 and 2, respectively. Result in Table 1 shows that the highest ranked motives were development of physical skills and abilities, keeping in shape physically, interacting with others, building friendship and meeting with new and different people. Conversely, the least ranked motives were getting away from everyday life, enhancement of overall mood, renewing energy levels and challenging ones' abilities. The study was interested is establishing whether the motives for soccer participation were mediated by level of study and birth ranks. ANOVA on universities athlete's birth ranks and motives for soccer participation did not yield any significant differences. Under the level of study, it is only the motive on *developing physical skills and abilities* on returned significant differences $F(4,239) = 3.39 \rho < 0.01$. Post hoc Tukey HSD reveals that students in their second level of study differed from the other year groups. They had the lowest mean of 3.97 in comparison to students who were

in their fifth level of study who had a mean of 4.75 which meant they perceived to have developed physical skills and abilities.

Results in Table 2 show that the first ranked connection to soccer was, *soccer is one of the most enjoyable things I do* (attraction), followed by *soccer is very important to me* (attraction), *soccer is the most satisfying thing that I do* (attraction). The least ranked reasons for connection to soccer were identity expression. To test for differences between connection to soccer and participants' level of study ANOVA returned significant differences on the item that *find a lot of my life is organized around soccer (centrality)* $F(4,239) = 2.73 \rho < 0.03$. Post hoc tests of Tukey HSD revealed that students who were in their first level of study and those in their fifth level of study differed from the other groups. The first level students had a mean of 4.10, while fifth level had a mean of 4.75. Regrettably there were no significant differences in connection to soccer based on the birth ranks of the respondents. The study sought to determine whether participation motivation was related to connection of soccer of the university athletes and the correlation between participation motivation and connection to soccer was ($r = 0.62 \rho > 0.00$) indicating that participation motivation correlated positively with connection to soccer.

DISCUSSION

The purpose of this study was to explore the relationship between participation motives and connection to soccer of university soccer players. Soccer player's motives for participation in sport were mainly for development of physical skills and abilities, keeping in shape physically, interaction and building friendships with others. These motives were mainly intrinsic and they have been reported in previous studies (Gitonga et al., 2003; Gaston-Gayles, 2005; Zaharidis et al., 2006; Waldron and Dieser, 2010; Ipinmoroti, 2011; Kondric et al., 2013; Ajowi et al., 2016). However, the first ranked motive of improving skills and physical abilities adds credence to the observation that universities are well placed to enhance the skills level of universities athletes as there are available resources and facilities (Suminski et al., 2002; Diehl et al., 2018). Secondly, it has been reported that intrinsic motivation has to do with commitment than extrinsic motivation (Garcia-Mas et al., 2010).

It had been hypothesized that participation motives for participation in soccer would differ based on the level of study of the university soccer players. From the nine motives, it is only the motive on developing physical skills and abilities that returned significant differences with students in their second level of study having the lowest scores. This is contrary to Ajowi et al. (2016) assertions that participation motives among soccer female players varied based on their level of study. This is fairly interesting where the student-athletes in the second level

Table 1. Means and standard deviation on motives for participation in soccer (n=242).

One of my reasons for participating in soccer is.....	\bar{x}	SD	Rank
To develop physical skills and abilities	4.25	0.82	1
To keep in shape physically	4.21	0.78	2
To interact with others	4.11	0.76	3
To build friendships with others	4.10	0.78	4
To meet new and different people	4.01	0.90	5
To challenge my abilities	3.90	1.04	6
To renew energy levels	3.81	1.00	7
To enhance my overall mood	3.59	1.00	8
To get away from my everyday life	3.45	0.50	9

Table 2. Means and standard deviations on connection to soccer of university athletes (n=242).

One of my reasons for participating in soccer is.....	\bar{x}	SD	Rank
Soccer is one of the most enjoyable things I do	4.17	4.17	1
Soccer is very important to me	4.09	0.89	2
Soccer is one of most satisfying things I do	3.98	0.94	3
I find a lot of my life is organized around soccer	3.72	1.01	4
Soccer occupies a central role in my life	3.62	1.04	5
To change my preference from soccer to another recreation activity will require major rethinking.	3.72	1.04	6
I enjoy discussing soccer with my friends	3.91	0.93	7
Most of my friends are in some way connected with soccer	3.77	1.03	8
Participating in soccer provides me with an opportunity to be with friends	3.98	0.92	9
When I participate in soccer I can really be myself	3.79	0.97	10
I identify with the people and image associated with soccer	3.79	0.93	11
When I'm participating in soccer I don't have to be concerned with the way I look	3.55	1.15	12
You can tell a lot about a person by seeing them participate in soccer	3.58	1.66	13
Participating in soccer says a lot about me	3.60	1.06	14
When I participate in soccer others see me the way they I want them to see me	3.61	1.10	15

of study perceive themselves to be developing physical skills and abilities. Participation in sport seems to increase with educational attainment both as a result of the longer period of time in which one has familiarized with sports (Cerin and Leslie, 2008). In related findings, Rintaugu et al. (2014) reported that first level students need to be guided, encouraged, supported and insulated from bullying by older students in order for them to continue participating in soccer. On the other hand, student-athletes in their final level of study had higher scores on the motive of developing physical skills and abilities. This could be attributed to the fact that the finalist may have developed a strong soccer identity. Therefore, it is imperative that university soccer administrators need to link up the finalists' players with soccer clubs so that they can continue participating in soccer upon exit from university.

Findings reveal that the soccer players are highly connected to soccer based on the five facets of connection. As seen in Table 2, the soccer player's had

high scores on attraction and centrality. Attraction to soccer is a combination of pleasure and importance attached to participation and perceived importance of their activity to the individual (Kyle et al., 2007). The facet of centrality insinuates that as people get connected to an activity they will organize their lives around soccer (Iwasaki and Havitz, 2004). This was expected as soccer was reported to be very popular in their universities. It appears that the soccer players have already formed strong athletic identities around soccer. This is supported by the fact that they had played competitive soccer for a relatively long period of time. In terms of connection to soccer there were no significant differences based on the level of study with the exception of *I find my life organized around soccer* (centrality). In this scenario, the first years had the lowest scores compared to the other groups. This is not remote as Njororai (2010) opines that the first year in the university is concerned by issues of settling down and experiencing freedom from parents. It is possible that first year students may not overtly commit themselves for

soccer participation as they have to attend to lectures, tutorials and laboratory work.

The findings indicated that there a positive correlation between participation motivation and connection to soccer. This is supported in Wood (2011) findings that students who take part in intramurals provide them with an opportunity to affirm their identity and continue with the social bonds with others.

CONCLUSION AND RECOMMENDATIONS

There are remarkable differences in the motives of participation and connection to soccer among university players. Therefore, coaches and trainers should be keen on the participation motives of the soccer athletes. This will be important, while scheduling training and competition. They need to operate at a higher level of coaching/instruction to ensure that players improve their skill level. Soccer players are highly connected to soccer and it will be important for universities to create conducive environments for soccer participation. University sport administration needs to create room for soccer players' growth and connection to elite soccer. Future studies can compare motivation and connection to soccer based on other demographic variables and the role of coaches and trainers in heightening both motivation and connectedness to soccer.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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