

TRAUMA AND POST-TRAUMATIC STRESS DISORDER (PTSD) IN WOMEN WITH ALCOHOL  
ABUSE AND DEPENDENCE IN A COMMUNITY SAMPLE IN THE WESTERN CAPE  
PROVINCE, SOUTH AFRICA

By

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## **Declaration**

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## **ABSTRACT**

Women in the communities of the Western Cape Province of South Africa are confronted with high levels of trauma exposure and acute stressful life events. Many live in rural communities where violence, rape, murder and substance abuse are prevalent. These women are also confronted with poor education, lack of support, poor health, are under-privileged and often live in overcrowded conditions (Riley et al., 2003). The consumption of alcohol during pregnancy is problematic – resulting in one of the highest provincial rates of Fetal Alcohol Syndrome (May et al., 2000). One of the major contributing factors is arguably untreated trauma and PTSD. However, rates of trauma exposure and PTSD have not previously been systematically documented.

This study aimed to (i) determine the prevalence of trauma and post-traumatic stress disorder (PTSD) in women with alcohol use disorders (AUDs) in a community sample relative to women without alcohol abuse/dependence, and to establish the relationship between trauma exposure, onset of PTSD and the severity and course of AUDs and other psychopathologies (e.g. depression, other anxiety symptoms, other substance misuse); (ii) further determine if the development of an AUD is secondary to the onset of PTSD and to assess if there are differences in the type and severity of exposure to traumatic and stressful life events in alcohol abusing/dependent women with and without PTSD; (iii) assess the relationship of co-morbid PTSD to drinking outcomes in women with AUDs who enter case management; and (iv) to assess the diagnostic difference between women who have a child with FASD (Fetal Alcohol Syndrome Disorder), and women who do not.

This study was nested within a National Institute on Alcohol Abuse and Alcoholism (NIAAA)-funded Fetal Alcohol Syndrome (FAS) Prevention Study that commenced in May 2008. The communities of Wellington, as well as the Bonnievale, Robertson, Ashton and Montagu (BRAM) communities in the Western Cape Province were included. Interviews, questionnaires and case note reviews were used to assess the relationship between trauma, PTSD, and alcohol use disorders in these communities and to establish the relationship of trauma and PTSD to drinking outcomes in a sub-sample of women who enter case management. In each area 99 randomly selected community members completed a community survey to determine the community profile and to establish community-specific challenges and stressors. The community survey sample included 79 males and 119 females in total. The maternal questionnaire component consisted of 100 mothers of FAS and Partial Fetal Alcohol Syndrome (PFAS) children, who were selected based on their children's diagnosis in the in-school screening phase. The first 100 mothers with a child with FAS or PFAS were classified as cases for this study. Some 400 controls were randomly selected in each study community (200 BRAM and 200 Wellington) and comprised mothers of children sampled in the in-school screening phase who did not have a diagnosis of FAS or PFAS. Thus, in total, 500 mothers completed maternal questionnaires. The case-management component involved 50 women in Wellington who were identified as being at high risk for a child with FASD. Assessments included interviews at intake, 6 months follow-up, 12 months follow-up, and 18 months follow-up.

The main findings of the study were as follows:

In terms of the prevalence of trauma and PTSD in women with and without alcohol abuse/dependence, the maternal study indicated that significantly more women with alcohol dependence and alcohol abuse had a diagnosis of PTSD ( $\chi^2 = 7.95$ ,  $p = 0.00$ ). The mean age that women with an alcohol use disorder and a diagnosis of PTSD started drinking alcohol regularly was 19.42 years ( $SD = 3.8$ ), and the mean age that women with an alcohol use disorder without a diagnosis of PTSD started drinking alcohol regularly was 17.81 years ( $SD = 2.6$ ), with a statistically significant group difference ( $t(320) = -1.87$ ,  $p = 0.05$ ). The results suggest that in women with an alcohol use disorder in whom a diagnosis of PTSD is also present, initiation of regular drinking occurs later in adulthood.

In terms of intimate partner violence, early life trauma and everyday stressful life events in women with alcohol abuse/dependence and PTSD, the following findings were evident: Women with an AUD and PTSD were significantly more exposed to intimate partner violence compared to women with an AUD without PTSD ( $\chi^2 = 7.42$ ,  $p = 0.00$ ). There were no significant group differences in childhood trauma exposure. Women with an AUD and PTSD also reported significantly more stressful life events than women with an AUD without PTSD ( $p = 0.00$ ). In addition, women with a FASD child had higher rates of PTSD, alcohol use disorder, depression and intimate partner violence compared to women without a FASD child with significant differences ( $p = 0.00$ ). The results indicated a positive association between the severity of alcohol abuse/dependence and the presence and severity of depressive symptoms ( $\chi^2 = 15.0$ ,  $p = 0.00$ ).

Women with an AUD and PTSD were expected to have worse drinking outcomes than those without a diagnosis of PTSD. The Davidson Trauma Scale and the PTSD module of the MINI were used to diagnose PTSD. The AUDIT was administered at intake, 6, 12 and 18 months follow-up to determine if there was a difference in drinking outcomes between women with and without PTSD. Women with PTSD had higher AUDIT scores at intake, 6 months follow-up and 12 months follow-up, but lower at 18 months follow-up, compared to women without PTSD. Women with PTSD, therefore, appear to have a more unfavourable drinking course than women without PTSD. However, the hypothesis that women with PTSD would have worse drinking outcomes (Schumacher et al., 2006) at 6 months follow-up and at 12 months follow-up could not be evaluated given the small sample of women evaluated in case management, and in particular the finding that only two women met criteria for PTSD. As such the sample did not provide adequate power to detect group differences. May et al. (2007) also recommended case management in a rural community in South Africa with high risk women.

The results highlight the importance of screening for psychopathology and appropriate intervention in women with and without AUDs. From the study it is evident that women who have AUDs are at high risk for depression, intimate partner violence and PTSD. In addition, women who experience trauma, depression and intimate partner violence require timeous interventions to prevent later development of alcohol abuse/dependence. More research on the effectiveness of case management for women with PTSD and alcohol dependence is required.

## OPSOMMING

Vroue in die gemeenskappe van die Wes- Kaap provinsie van Suid- Afrika word gekonfronteer met hoë vlakke van trauma blootstelling en akute stressvolle lewensomstandighede. Hulle woon in landelike gemeenskappe waar geweld, verkragting, moord en substansmisbruik voorkom. Hierdie vroue word ook gekonfronteer met swak opvoeding, min ondersteuning, swak gesondheid, is minderbevoorreg en het dikwels oorbewoonde huislike omstandighede (Riley et al., 2003). Die inname van alkohol onder vroue in die Wes-Kaap provinsie tydens swangerskap is kommerwekkend en dit is een van die provinsies met die hoogste voorkoms van Fetale Alkohol Sindroom in die wêreld (May et al., 2000). Een van die bydraende faktore kan moontlik toegeskryf word aan onbehandelde trauma en PTSS waarmee hierdie vroue moet saamleef. Trauma blootstelling en PTSS is nog nie voorheen sistematies in hierdie gemeenskappe gedokumenteer nie.

Die oogmerk van die studie was om die voorkoms van trauma en post-traumatische stres versteuring (PTSS) te bepaal in 'n steekproef vroue met alkohol- misbruik versteurings relatief tot vroue sonder alkohol misbruik/afhanklikheid, en om die verhouding tussen blootstelling aan trauma, aanvangs van PTSS en die graad van erns en verloop van alkohol-gebruik versteurings en ander psigopatologie (depressie, ander angssimptome, ander substans misbruik) vas te stel. Verder het die studie gepoog om te bepaal of die ontwikkeling van 'n alkohol-misbruik versteuring sekondêr is tot die aanvangs van PTSS en om vas te stel of daar 'n verskil in die tipe en erns van blootstelling aan traumatiese en stressvolle

lewensgebeure is by vroue wat alkohol misbruik of afhanklik is van alkohol met of sonder PTSV. Die studie het ook probeer om te bepaal wat die uitkomst sal wees indien vroue met PTSV en alkohol-misbruik versteurings gevallebestuur ondergaan. Laastens is die diagnostiese verskil tussen vroue met 'n FASD (Fetale Alkohol Sindroom Versteuring) en vroue sonder 'n kind met FASD ondersoek.

Hierdie studie was 'n substudie van die Fetale Alkohol Sindroom (FAS) voorkomingstudie wat in Mei 2008 begin het en deur die Nasionale Instituut van Alkoholmisbruik en Alkoholisme (NIAAA) befonds is. Die studie het die Wellington sowel as die Bonnievale, Robertson, Ashton en Montagu (BRAM) gemeenskappe in die Wes-Kaap betrek. Onderhoude, vraelyste en gevallebestuur is gebruik om die verwantskap tussen trauma, PTSV en alkohol-misbruikversteuring in hierdie gemeenskappe en die verhouding wat trauma en PTSV op drink uitkomst het in 'n sub-steekproef vroue wat deel gevorm het van die gevallebestuur komponent, te bepaal. Die gemeenskapsonderhoude-komponent het behels dat daar in elk van die studie areas 99 onderhoude met manlike en vroulike lede van die gemeenskappe gevoer is om inligting oor kennis, houding, gedrag en sienswyses oor alkohol en die gevolge te bepaal sowel as om die spesifieke uitdagings en stressore in die gemeenskappe te bepaal. Daar is van 'n ewekansige steekproef gebruik gemaak om die deelnemers te kies. In totaal het 79 mans en 119 vroue aan die onderhoude deelgeneem. In die moederlike onderhoude het daar 100 moeders van FAS en PFAS kinders deelgeneem wat gekies is op grond van hulle kinders se diagnose in die skool-ondersoeke. Die eerste 100 moederlike onderhoude met moeders wat 'n kind met FAS of PFAS in Graad 1 het, is gebruik vir die studie. Die 400 kontrole moeders wat deelgeneem het aan die moederlike onderhoude is

die moeders van die Graad 1 leerders wat nie 'n diagnose van FAS or PFAS het nie. Die eerste 400 moederlike onderhoude in elke area van kontrole kinders (200 BRAM en 200 Wellington) is gebruik as kontroles vir hierdie studie. Dus het 500 moeders in totaal deel gevorm van die moeder-onderhoude komponent. Die Gevallebestuur-komponent het uit 50 vroue in Wellington bestaan wat as 'n hoë risiko beskou is om 'n kind met FASD in die toekoms te kry. Die komponent het uit inname-onderhoude, 6 maande-, 12 maande- en 18 maande opvolg-onderhoude bestaan het.

Die studie het die volgende uitkomst gelewer:

In terme van die voorkoms van trauma en PTSV in vroue met en sonder alkohol misbruik/verslawing het die hoof bevindings aangedui dat meer vroue met 'n diagnose van alkoholafhanklikheid/misbruik 'n diagnose van PTSV het, met 'n betekenisvolle verskil ( $\chi^2 = 7.95$ ,  $p=0.00$ ). Die gemiddelde ouderdom waarop vroue met alkoholafhanklikheid/misbruik en PTSV gereeld alkohol begin drink het, is 19.42 jaar ( $SA=3.8$ ) en die gemiddelde ouderdom waarop vroue met alkoholafhanklikheid/misbruik sonder PTSV gereeld alkohol begin drink het is 17.81 jaar ( $SA=2.6$ ) met 'n betekenisvolle verskil ( $t(320) = -1.87$ ,  $p=0.05$ ). Die resultate het aangedui dat in vroue met 'n alkohol misbruik-versteuring en 'n diagnose van PTSV, die aanvang van gereelde drinkery later in volwasse jare geskied.

In terme van intieme verhoudingsgeweld, vroeë lewenstrauma en elke dag stresvolle lewensgebeure in vroue met alkohol misbruik/verslawing en PTSV is die volgende bevind: Vroue met alkoholmisbruik/verslawing en PTSV is meer blootgestel aan intieme verhoudingsgeweld in vergelyking

met vroue sonder PTSV met betekenisvolle verskille ( $\chi^2 = 7.42$ ,  $p=0.00$ ). Vroue met alkoholmisbruik/verslawing sonder PTSV het 'n hoër gemiddelde telling op die CTQ gehad as vroue met alkoholmisbruik/verslawing en PTSV, maar dit was nie 'n betekenisvolle verskil nie. Vroue met alkoholmisbruik/verslawing en PTSV het meer elke dag stresvolle lewensgebeure gerapporteer as vroue met alkoholmisbruik/verslawing sonder PTSV ( $p=0.00$ ). Vroue met 'n Fetale Alkohol Sindroom Versteuring kind, het 'n hoër voorkoms van PTSV, alkoholmisbruikversteuring, depressie en intieme verhoudingsgeweld gehad in vergelyking met vroue sonder 'n Fetale Alkohol Sindroom Versteuring kind, met betekenisvolle verskille ( $p=0.00$ ). Die resultate het aangedui dat daar 'n positiewe assosiasie tussen die erns van alkoholmisbruik/verslawing en die voorkoms en graad van depressiewe simptome ( $\chi^2 = 15.0$ ,  $p=0.00$ ) is.

Daar is verwag dat vroue met 'n alkoholgebruik-versteuring en PTSV swakker drinkuitkomst sou toon as vroue sonder 'n diagnose van PTSV. Die Davidson Trauma Skaal en die PTSV module van die MINI was gebruik om 'n diagnose van PTSV te maak. Die AUDIT is afgeneem met inname, 6 maande, 12 maande en 18 maande opvolg om te bepaal of daar 'n verskil in drinkuitkomst tussen vroue met en sonder PTSV is. Vroue met PTSV het hoër AUDIT tellings tydens inname, 6 maande opvolg en 12 maande opvolg gehad, maar laer tellings met 18 maande opvolg in vergelyking met vroue sonder PTSV. Dit kom dus voor asof vroue met PTSV 'n meer ongunstige verloop van drink het as vroue sonder PTSV. Die hipotese dat vroue met PTSV swakker drinkuitkomst (Schumacher et al., 2006) met 6 maande opvolg en 12 maande opvolg sou gehad het kon nie ge-evalueer word nie as gevolg van die

klein steekproef vroue in gevallebestuur en meer spesifiek die bevinding dat net twee vroue aan die kriteria van PTSV voldoen het. Die steekproef het nie genoegsame krag gehad om groepeerse verskille aan te dui nie. May et al. (2007) het ook gevallebestuur aanbeveel vir hoër risiko vroue in 'n landelike gemeenskap in Suid Afrika.

Uit die navorsing blyk dit dat vroue met alkoholgebruik-versteurings ook 'n risiko het om depressie, intieme verhoudingsgeweld en PTSV te ervaar. Gereelde assessering en intervensie vir patologie in vroue met en sonder alkoholgebruik-versteurings is belangrik. Vroue wat trauma, depressie en intieme verhoudingsgeweld ervaar moet gereelde intervensie ontvang om moontlike latere ontwikkeling van alkoholgebruik-versteurings te voorkom. Die resultate van die studie dui daarop dat verdere navorsing oor die effektiwiteit van gevallebestuur in vroue met PTSV en alkohol afhanklikheid nodig is.

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Philippians 13:19.

## LIST OF ABBREVIATIONS

<b>APA</b>	American Psychiatric Association
<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>ARND</b>	Alcohol related neurological defects
<b>ARBD</b>	Alcohol Related Birth Defects
<b>AUD'S</b>	Alcohol Use Disorders
<b>AUDIT</b>	Alcohol Use Disorder Identification Test
<b>BAC</b>	Blood Alcohol Concentration
<b>BMI</b>	Body Mass Index
<b>BRAM</b>	Bonnievale, Robertson, Ashton and Montagu
<b>CBT</b>	Cognitive Behaviour Therapy
<b>CF</b>	Coaching Families Programme
<b>CRAFT</b>	Community Reinforcement and Family Training Programme
<b>CSA</b>	Child sexual abuse
<b>CTQ-SF</b>	Childhood Trauma Questionnaire (Short Form)
<b>CTQ-SA</b>	Childhood Trauma Questionnaire: Sexual Abuse subscale
<b>CTQ-PA</b>	Childhood Trauma Questionnaire:Physical Abuse subscale
<b>CTQ-EA</b>	Childhood Trauma Questionnaire: Emotional Abuse subscale
<b>CTQ-PN</b>	Childhood Trauma Questionnaire: Physical Neglect subscale
<b>CTQ-EN</b>	Childhood Trauma Questionnaire: Emotional Neglect subscale

<b>DSM IV-TR</b>	Diagnostic and Statistical Manual of Mental Disorders (4th ed, text rev.)
<b>DTS</b>	Davidson Trauma Scale
<b>ECT</b>	Electro Convulsive Therapy
<b>FAS</b>	Fetal Alcohol Syndrome
<b>FASD</b>	Fetal Alcohol Spectrum Disorder
<b>FMF</b>	Families Moving Forward Programme
<b>HIV</b>	Human Immunodeficiency virus
<b>ICD</b>	International Classification of Diseases
<b>IOM</b>	Institute of Medicine
<b>KABB</b>	Survey of adult drinking, knowledge, attitudes, beliefs and behaviours
<b>LEC</b>	Life Events Checklist
<b>MAP</b>	Men as partners
<b>MINI</b>	Mini International Neuro- psychiatric Interview
<b>MDD</b>	Major Depressive Disorder
<b>PCIT</b>	Parent-Child Interaction Therapy
<b>PFAS</b>	Partial Fetal Alcohol Syndrome
<b>PSM</b>	Parenting Support and Management Programme
<b>PTSD</b>	Post-traumatic Stress Disorder
<b>SSCL 51</b>	Self-Report Symptoms Checklist
<b>STI</b>	Sexually Transmitted Infections

<b>SUD'S</b>	Substance Use Disorders
<b>UNM</b>	University of New Mexico
<b>WHO</b>	World Health Organization

## LIST OF TABLES

Table 1 Community Survey: Demographic Characteristics	152
Table 2 Maternal Study: Demographic Characteristics	153
Table 3 Maternal Study: Maternal Risk factors	154
Table 4 Case Management: Demographic Characteristics	155
Table 5 Community Survey: Behaviour caused by alcohol	164
Table 6 Community Survey: Life Events Checklist	165
Table 7 Case Management (Intake): MINI Diagnosis and Alcohol Dependence/Abuse	171
Table 8 Maternal Study: MINI Diagnoses	172
Table 9 Psychopathology in women in Case Management (Intake, 6 months follow-up, 12 months follow-up, 18 months follow-up)	173
Table 10 Maternal Study: Trauma and trauma related symptoms	174
Table 11 Maternal Study: Intimate partner violence and Alcohol abuse/Dependence	181
Table 12 Maternal Study: Partner Violence and PTSD	182
Table 13 Maternal Study: Partner Violence, alcohol use disorders and PTSD	183
Table 14 Maternal Study: Intimate Partner Violence and FAS	184
Table 15 Partner Violence in Case Management	186
Table 16 Partner Violence and Alcohol Use Disorders in Case Management	187
Table 17 Partner Violence and PTSD in Case Management	188
Table 18 A trial of FAS Prevention in a South African community	227

Table 19 Time Sequence of FAS prevention in South Africa	229
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## LIST OF FIGURES

Figure 1.1 Wellington Community Survey-Drinks in past 30 days	191
Figure 1.2 BRAM Community Survey-Drinks in past 30 days	192
Figure 2.1 Maternal Study: (SSCL51 Total and Current Alcohol Abuse-MINI)	193
Figure 2.2 Maternal Study: Davidson Trauma Scale (Total Score and Current Alcohol Dependence-MINI)	194
Figure 2.3 Maternal Study: Davidson Trauma Scale and Current Alcohol Abuse (MINI)	195
Figure 2.4 Childhood Trauma Questionnaire and current Alcohol Dependence (MINI)	196
Figure 2.5 Maternal Study: SSCL51 Total and current Alcohol Dependence (MINI)	197
Figure 2.6 Maternal Study: Childhood Trauma Questionnaire and current Alcohol Abuse (MINI)	198
Figure 2.7 Maternal Study: Childhood Trauma Questionnaire and PTSD	199
Figure 2.8 Maternal Study: SSCL 71 Total and current PTSD (MINI)	200
Figure 2.9 Maternal Study: Childhood Trauma Questionnaire (FAS and No FAS)	201
Figure 2.10 Maternal Study: SSCL 51(Totals for FAS and No FAS)	202

Figure 2.11 Maternal Study: Davidson Trauma Scale (FAS and No FAS)	203
Figure 2.12 SSCL 51 Total in Case Management (Intake, 6, 12, 18 months follow-up)	204
Figure 2.13 AUDIT in Case Management (Intake, 6, 12, 18 months follow-up)	205

## CONTENTS

Abstract	3
Opsomming	7
Acknowledgements	12
Abbreviations	15
Chapter 1 Introduction	26
1.1 Rationale	26
1.2 Aims and Objectives	28
1.3 Study hypothesis	30
1.4 Research Questions	30
1.5 Overview of Chapters	31
Chapter 2: Comorbid psychopathology in women who abuse alcohol	33
2.1 Trauma exposure	33
2.2 Post Traumatic Stress Disorder (PTSD)	35
2.2.1 PTSD in females	36
2.2.2 PTSD in South-Africa	37
2.2.3 PTSD and substance abuse/dependence	37
2.2.4 PTSD and childhood abuse	40
2.2.5 PTSD and neurobiology	40
2.3 Intimate Partner Violence	41

2.4 Other psychopathologies in women	44
2.4.1 Depression	44
2.5 Prevention and Intervention in PTSD and trauma, domestic violence and depression	48
2.5.1 PTSD and trauma	48
2.5.2 Domestic Violence	49
2.5.3 Depression	51
Chapter 2 References	55
3. Chapter 3: Maternal drinking and FASD	71
3.1 Alcohol dependence in women	71
3.2 Maternal drinking in HIV positive women	75
3.3 Drinking behaviours of women that can cause FASD	75
3.4 Consequences for the drinking mother	78
3.5 Prevention and Intervention of alcohol abuse in high risk women	79
Chapter 3 References	83
4.1 Chapter 4 Introduction	92
4.2 Epidemiology of FASD	92
4.3 FASD in the Western Cape Province of South Africa	97
4.4 Consequences for the child	97
4.5 Maternal Risk factors for FASD	99
4.6 Prevention and Intervention of children diagnosed with FAS/FASD	101

Chapter 4 References	107
Chapter 5: Methodology	118
5.1 Study Sample	118
5.2 Study Design	120
Flow diagram (study sample)	122
5.3 Procedures	123
5.4 Instruments	128
5.4.1 Demographic Questionnaire	129
5.4.2 MINI (Mini International Neuro Psychiatric Interview)	129
5.4.3 Life Event's Checklist (LEC)	130
5.4.4 Davidson Trauma Scale (DTS)	131
5.4.5 Childhood Trauma Questionnaire (CTQ-SF)	133
5.4.6 Partner Violence Questionnaire	134
5.4.7 Self Report System Checklist (SSCL 51)	134
5.4.8 Alcohol Use Disorder Identification Test (AUDIT)	137
5.4.9 CAGE	138
5.5 Ethical Considerations	139
5.6 Statistical Analysis	140
Chapter 5 References	145
Chapter 6 (Results)	148

6.1 Demographic Characteristics (Community Survey, Maternal Study, Case Management)	150
6.2 Drinking characteristics in the community	156
6.3 Stressors and challenges in the communities	160
6.4 Will rates of PTSD be higher in women with alcohol abuse/dependence compares to those without?	166
6.5 Will the severity and course of alcohol abuse/dependence be negatively influenced by the presence and severity of PTSD symptoms, and other co-morbidity (e.g. depression)?	167
6.6 Is the development of an alcohol use disorder more likely secondary to the onset of PTSD in women with life time PTSD?	175
6.7 Are women with alcohol abuse/dependence and PTSD more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD?	176
6.8 Will women with alcohol use disorders and PTSD who enter case management have worst drinking outcomes than those without PTSD?	189
Chapter 7 Discussion	206
7.1 Introduction	206
7.2 Demographic Information	207
7.3 Alcohol Dependence/Abuse and PTSD	208
7.4 Impact of PTSD symptoms and other psychopathology on the severity of alcohol dependence	209

7.5 PTSD and secondary onset of Alcohol Use Disorder	210
7.6 Alcohol Use Disorders, PTSD and histories of partner violence, early life Trauma and everyday stressful life events	211
7.7 Alcohol Use Disorder Comorbid with PTSD and drinking outcomes	212
7.8 Psychiatric differences in women with and without a FASD child	213
7.9 Limitations of the Study	214
Chapter 7 References	216
Chapter 8: Conclusions and Recommendations	223
8.1 Conclusion	223
8.2 Recommendations for the practice	224
8.3 Recommendations for future studies	225

## **CHAPTER 1**

### **INTRODUCTION**

The rationale for the study is discussed in this chapter. The aims, study hypothesis and research questions are outlined and an overview of subsequent chapters provided.

#### **1.1 Rationale**

Previous work suggests that alcohol misuse affects 83% of male fruit farm workers in the Western Cape Province of South Africa; 87% of farm workers were classified as problem drinkers (Khaole et al., 2004). A major form of recreational activity on wine-producing and fruit farms in the Western Cape revolves around heavy drinking (Khaole et al., 2004; May et al., 2008; King et al., 2004). Women constitute roughly 30% of the agricultural workforce in the Western Cape and more than two thirds of these families are poor (London, 2003). The Western Cape Province has been found to have the highest rates of harmful (13.8%) and binge drinking (24%) in South Africa (London et al., 1998; Reid et al., 1999).

Approximately 250 000 shebeens are operating illegally in the Western Cape (May et al., 2005). This leads to alcohol being highly affordable and easily obtainable for the poor workers (Mckinstry, 2005). The high alcohol consumption in these communities is further worsened by the lack of recreational activities (May & Gossage, 2001; 2004). It is mostly the coloured population of the province that are affected by these drinking practices (23%) and 11.6% of coloured pregnant women drink hazardously

during pregnancy (Peltzer & Ramlagan, 2009). Some studies indicate that alcohol is consumed by up to 50% of pregnant women in the Western Cape, resulting in one of the highest provincial rates of Fetal Alcohol Syndrome (May et al., 2000). May et al. (2000) found that women in South-African studies often have acute stressful life events during pregnancy which leads to heavy prenatal abuse of alcohol. Alcohol is often used by the women to escape from their situation and to cope with current circumstances. Many women in these communities reported that they experienced depression, poor self-esteem and low self-worth (Mckinstry, 2005).

Women in the aforementioned communities are confronted with high levels of trauma exposure. They live in rural communities where violence, rape, murder and substance abuse are present. The women are also challenged with respect to poor education, lack of support, poor health, lack of privileges and often overcrowded living conditions (Riley et al., 2003). However, rates of trauma exposure and PTSD have not systematically been documented before.

The current study will yield estimates of the rates of trauma (childhood-and adult-onset trauma) and PTSD, and date of onset, course and temporal relationships of PTSD, in order to better inform intervention programmes in a rural community in the Western Cape Province of South Africa.

## 1.2 Aims and Objectives

This study investigated the prevalence of trauma, post-traumatic stress disorder (PTSD) and other psychopathologies in women with an alcohol use disorder (alcohol abuse or dependence) (AUDs).

The principal aim was to establish the relationship between the traumatic exposure, onset of PTSD and the severity and course of AUDs and other psychopathologies (e.g. depression, other anxiety symptoms, and other substance misuse) among women in rural communities in the Western Cape.

The following objectives were derived from this principal aim:

- I) To determine if the development of an AUD is secondary to the onset of PTSD.
- II) To assess if there is a difference in the type (e.g. partner violence vs. past childhood trauma) and severity of exposure to traumatic and stressful life events in alcohol abusing/dependent women with and without PTSD.
- III) To assess the relationship of co-morbid PTSD to drinking outcomes in women with alcohol use disorder who enter into case management.
- IV) To assess psychiatric diagnostic differences between women who have a child with FASD (Fetal Alcohol Syndrome Disorder) and women who do not.

The aforementioned study was nested within an FAS Prevention Study. An overview of the 5 year study is summarised in Addendum-Table 1. The aims of the FAS Prevention Study were to:

- assess the efficacy of the comprehensive FAS prevention model using a multiple-community, longitudinal, comparative design, recommended by the Institute of Medicine (IOM).
- directly measure overall efficacy of the ‘research only’ phase as well as the prevention phase, in the community-level age-specific rates of FAS and Partial FAS.
- measure baseline conditions and post-intervention changes in community-wide proxy measures through two studies nested within the design: an extensive, random-sample survey of adult drinking, knowledge, attitudes, beliefs and behaviours (KABB) related to drinking and FASD and through the Community Readiness for Change survey.
- link the level of participation in FASD-prevention activities directly to change through the above adult drinking and KABB survey, and even more directly and specifically through extensive formative/process evaluation within the selective (e.g. screening activities) and indicated (e.g. case management) levels of prevention.
- in another study nested within the prevention trial, define the specific maternal risk factors for FAS in the population.
- use the multiple data sources collected, to define baseline conditions and address outcomes of the prevention initiative to investigate several basic science issues.

### **1.3 Study Hypotheses**

Hypothesis 1: Rates of PTSD will be higher in women with alcohol abuse or dependence compared to those without.

Hypothesis 2: The severity and course of alcohol abuse/dependence will be negatively influenced by the presence and severity of PTSD symptoms and other co- morbidity (e.g. depression).

Hypothesis 3: In women with lifetime PTSD, the development of an alcohol use disorder is more likely to be secondary to the onset of PTSD.

Hypothesis 4: Women with alcohol abuse/dependence and PTSD are more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD.

Hypothesis 5: Women with alcohol use disorders and PTSD who enter into case management will have worse drinking outcomes than those without PTSD.

### **1.4 Research Questions**

1. Will rates of PTSD be higher in women with alcohol abuse or dependence compared to those without?
2. Will the severity and course of alcohol abuse/dependence be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity (e.g. depression)?

3. Is the development of an alcohol use disorder more likely secondary to the onset of PTSD in women with lifetime PTSD?
4. Are women with alcohol abuse/dependence and PTSD more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD?
5. Will women with alcohol use disorders and PTSD who enter case-management have worse drinking outcomes than those without PTSD?

## **1.5 Overview of chapters**

The second chapter investigates co-morbid psychopathologies, including trauma exposure, PTSD and domestic violence in women that abuse alcohol, during pregnancy and independent of pregnancy. The prevention and intervention of PTSD, domestic violence and depression is also discussed.

The third chapter focuses on maternal drinking and FASD. Alcohol dependence in women, maternal drinking in HIV positive women, drinking habits that can cause FASD and consequences for the drinking mother is discussed, as well as the prevention and intervention of alcohol abuse in high risk women.

The fourth chapter provides information about the epidemiology of FASD, the prevalence of FASD in the Western Cape Province of South Africa, consequences for the child affected by FASD and maternal risk factors pertaining to FASD. The prevention and intervention of a child diagnosed with FASD are also discussed.

The fifth chapter focuses on the methods of the study including the study design, study sample, procedures, instruments and statistical analysis.

Chapter six contains the results of the study, including the community survey, maternal questionnaire and case management components.

The discussion and limitations of the study form part of chapter seven.

Chapter eight comprises the conclusion and recommendations for the practice and future research.

## **CHAPTER 2**

### **CO-MORBID PSYCHOPATHOLOGY AND DOMESTIC VIOLENCE IN WOMEN WHO ABUSE ALCOHOL**

This chapter describes trauma exposure, Post Traumatic Stress Disorder (PTSD), domestic violence and other psychopathologies in women who abuse alcohol during pregnancy and independent of pregnancy. Information about the prevention and intervention of PTSD and trauma, domestic violence and depression is also provided.

#### **2.1 Trauma exposure**

Kaminer et al. (2008) found that over one third of the South African population is exposed to some form of violence during their lifetime. Some studies argue that individuals, who were victims of trauma as children as opposed to adults, are more affected. Duncan et al. (1996) found higher levels of depression, post-traumatic stress disorder and substance abuse in adults who were victims of child abuse than in those who were not exposed to abuse as children. This is consistent with the findings of Covington and Kohen (1984) who concluded in their study on adult women that those who abused alcohol and other substances had higher rates of physical, sexual and emotional abuse during childhood than non-abusers. With regard to past trauma, it has been argued that childhood trauma does not increase the risk for

substance abuse, but that the development of PTSD in the context of prior childhood trauma might be a causal risk factor for substance use disorders (Breslau et al., 2003).

In a study on traumatic experiences and post-traumatic stress disorder in early and late onset alcoholism, Dom et al. (2007) also observed a link between early childhood trauma and the early onset of alcoholism. In another study Romans et al. (1999) concluded that adult women were twice as likely to seek help from mental health professionals if they had a history of childhood sexual abuse in comparison with non- abused women. In some instances, a traumatic event may lead to a person drinking more in order to cope with the event. Alcohol and/or drugs are typically used to relieve distressing psychological symptoms (Khantzian, 1985). Min et al. (2007) found that childhood trauma can be an etiological factor in substance abuse and psychological distress. On the other hand, alcohol and/or drug abuse may expose an individual to trauma, and thereby increase susceptibility to PTSD (Chilcoat and Breslau, 1998; Breslau et al., 2003). An increased risk for alcohol abuse/dependence was found in women exposed to trauma and not only in women with PTSD (Breslau, 2003).

The reaction to trauma varies from individual to individual and from situation to situation. According to Foa, Stein and McFarlane (2006), disaster victims who lost their homes or livelihoods may have a different response than individuals who were victims of more personal trauma. Porcerelli (2006) found that women who were physically victimised by multiple perpetrators had more alcohol use problems than women who were physically victimised by one perpetrator or not victimised at all. There are also

different psychological disorders that can result from trauma exposure. Norris, Friedman and Watson (2002) reviewed studies of disaster victims and summarised six categories of response that resulted from major trauma: 1) specific psychological disorders (including depression, anxiety and PTSD), 2) nonspecific distress, 3) health problems, 4) chronic problems in living, 5) loss of resources, 6) distinctive problems that are specific amongst younger victims. In these studies the prevalence rate for PTSD developing after trauma was 68%, whereas Major Depressive Disorder had a prevalence rate of 36%, and anxiety (including panic disorder and general anxiety disorder) resulted in 20% of the cases.

## **2.2 Post Traumatic Stress Disorder (PTSD)**

Exposure to a life-threatening traumatic event (actual or threatened death or serious injury) that produces intense fear, helplessness or horror may be associated with the development of PTSD (DSM-IV-TR, American Psychiatric Association, 2000). In addition to the aforementioned requirements of exposure and subjective responsiveness, the traumatic event needs to be persistently re-experienced in one or more of the following ways: recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions; recurrent distressing dreams of the event; acting or feeling as if the traumatic event were recurring (including a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes that occur on awakening or when intoxicated); intense psychological distress at exposure to internal or external cues that symbolise or resemble aspects of the traumatic

event; psychological reactivity on exposure to internal or external cues that symbolise or resemble as aspects of the traumatic event.

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness as well as persistent symptoms of increased arousal (for example, difficulty sleeping, anger, concentration problems, hyper vigilance and exaggerated startle response) are also part of the symptom complex. The duration of these symptoms must be at least one month and must impair an individual's functioning. PTSD not only influences the person experiencing the disorder, but also the family and greater society (Creamer et al., 2001). PTSD is more common after certain kinds of trauma exposure, for instance rape and sexual violence. McFarlane (2000) found a PTSD prevalence rate of 70% or more following these sexual traumas, whereas motor vehicle accidents resulted in 43% of people developing PTSD (Coffey et al., 2006).

### **2.2.1 PTSD in females**

A consistent and widely replicated finding is the higher risk of the disorder in women compared to men. Even though males are more exposed to trauma than females, the ratio of women that develop PTSD is 2:1 (Breslau, 2001). A variety of factors, including female differences in psychobiological reactions to trauma, trauma type, younger age of onset of trauma exposure in women, stronger perceptions of threat and loss of control, higher levels of peri-traumatic dissociation, insufficient social support resources, and

greater use of alcohol to buffer trauma-related symptoms (namely intrusive memories and dissociation) have been posited as an explanation for the higher rates of PTSD in women (Olf et al., 2007).

### **2.2.2 PTSD in South Africa**

A prevalence study in a South African township's primary healthcare clinic found PTSD to be the second most common psychiatric diagnosis made, with 20% of patients diagnosed with PTSD (Carey et al., 2003). PTSD has also been investigated in an in-patient setting in the Western Cape where 40% of patients who have never been diagnosed with PTSD before, met the criteria for PTSD during this study (van Zyl et al., 2008). Although studies are few, high rates of trauma and PTSD have been documented among South African females in both urban and rural settings (Seedat et al., 2004; Carey et al., 2003; Dinan et al., 2004; Peltzer et al., 2007).

### **2.2.3 PTSD and substance abuse/dependence**

PTSD is also commonly co-morbid with substance abuse and dependence (Reynolds et al., 2005). Individuals with high rates of alcohol abuse have a higher prevalence of PTSD and a poorer outcome of alcohol abuse treatment when their PTSD is left untreated (Schumacher et al., 2006). Rates of 30-59% of co-morbid PTSD in individuals in treatment for substance use disorders (SUDs) have been documented (Stewart et al., 2000). Norman et al. (2007) reported that in treatment-seeking patients with SUDs, over

80% met the criteria for one PTSD symptom cluster. The authors argued that trauma should be addressed in SUD patients, even though the full criteria for PTSD might not be met. Only one percent of people develop enough symptoms to meet the full criteria (Kessler et al., 1995). Even if the full criteria for PTSD are not met, individuals still have functional impairment similar to those individuals with full PTSD (Arnow, 2004). According to Farley et al. (2002), patients with SUDs very commonly endorse traumatic experiences, with rates of traumatic exposure as high as 89%.

Furthermore, in substance dependent patients, female gender, exposure to combat, sexual assault, or physical assault, and a history of major mood or anxiety disorder have been documented as predictors of PTSD (Peirce et al., 2008).

It is possible that the relationship between alcohol abuse and PTSD may be non-causal, with each ascribed to independent genetic factors and environmental agents, and although this is unlikely to be the case, as literature indicates that there might be a link between the two. The first pathway suggests that PTSD is secondary to substance abuse. The person is placed in dangerous situations in order to sustain the drinking habit and in so doing is exposed to physical and psychological trauma (Cottler et al., 1992). The second pathway suggests that alcohol abuse/dependence is secondary to the development of PTSD. Individuals with PTSD, use alcohol and/or drugs out of a belief that the distressing effects of the PTSD symptoms will be relieved by these substances, in accordance with the self-medication hypothesis (Chilcoat & Breslau, 1998). Patients with PTSD have reported that they experience relieve when they

use central nervous system depressants (Bremner et al., 1996). Startle responses have also been reportedly relieved by alcohol (Hutchison et al., 1997). Clinical evidence suggests that the choices of substances that are used to relieve symptoms are influenced by the particular PTSD symptom that a person is experiencing. Someone that is dependent on alcohol may experience more arousal symptoms than someone that is addicted to cocaine (Saladin et al., 1998). Although alcohol is initially taken to alleviate arousal symptoms caused by PTSD, the arousal symptoms that are caused by alcohol withdrawal is also intolerable. This causes more drinking and relapses to once again escape the arousal symptoms (van der Kolk et al., 1985).

A few studies of PTSD have addressed the issue of alcohol co-morbidity by matching or using statistical controls for the effects of alcoholism (Bremner et al., 1995) and have continued to find hippocampal abnormalities. A recent study, investigating whether volumetric and metabolic abnormalities in the hippocampus in PTSD were dependent on the effects of alcohol abuse, documented reduced N-acetyl aspartate (NAA), which is a metabolic marker of neuronal integrity in the hippocampus and anterior cingulate, independent of the effects of both alcohol abuse and childhood trauma (Schuff et al., 2008). In addition to structural and functional brain abnormalities, PTSD is also associated with neuropsychological deficits (decreased verbal memory, attention, and processing speed performance) which may be compounded by the presence of an alcohol abuse history (Samuelson et al., 2006). In a study by Hasin et al. (2008) it was found that the more severe the alcohol dependence, the more severe other associated disorders are.

#### **2.2.4 PTSD and childhood abuse**

Research has shown that child sexual abuse increases the risk of PTSD (Paulucci, Genuis & Violato, 2001). In patients with alcohol disorders, childhood sexual abuse and not childhood physical abuse is more strongly associated with the development of PTSD (Langeland, Draijer & van den Brink, 2004). Childhood sexual abuse can also be significantly associated with earlier age of onset of alcohol disorder (Zlotnick et al., 2006). Consistent with this, Schumacher et al. (2006) observed that adults with co-morbid PTSD and alcohol dependence who had also experienced childhood trauma had more severe PTSD symptoms, alcohol cravings and trauma-related cravings than those without childhood trauma. According to Lehmann (1997), the rate of development of PTSD in a child who has witnessed maternal assault is as high as 50%. Certain characteristics like a tendency to be anxious, lower education levels and ethnicity may place individuals at a higher risk of trauma and thus increase their risk of developing PTSD (Breslau, David & Andreski, 1995).

#### **2.2.5 PTSD and neurobiology**

Finally, PTSD is also known to have neurobiological underpinnings and several neuro-imaging studies have focused on potential abnormalities in the hippocampus, a region which is known to play a critical role in conditioned fear responses, learning and memory. Many of these studies have found evidence for

hippocampal volume deficits (i.e. reduced hippocampal volumes) in adults with PTSD, including adults with a history of physical and/or sexual childhood abuse (Bremner et al., 1997; Stein et al., 1997), while others have not. The majority have excluded subjects with recent alcohol abuse.

### **2.3 Intimate Partner Violence**

In a review in 1999 in 35 countries, it was found that between 10% and 52% of women reported that they had experienced physical abuse by a partner and between 10% and 30% had an intimate partner that was sexually violent (Heise & Garcia-Moreno, 2002). Between 15% and 71% of women aged 15-49 globally reported that they were physically and/or sexually abused by an intimate partner at least once in their lives (Garcia-Moreno, C et al., 2006). One of the highest rates of intimate partner violence amongst pregnant women globally is found in Africa (Shamu et al., 2011). Kaminer et al. (2008) found that South African women are more at risk of physical assault by an intimate partner than being exposed to any other form of violence. In contrast, men in South Africa are most at risk to be victims of criminal violence. In South Africa, many women lose their lives at the hand of an intimate partner (Matzopoulos, 2004; Matthews et al., 2007). In a study by Abrahams et al. (2009), it was found that 50.3 % of all homicides across 20 mortuaries in South-Africa were a result of intimate partner violence. Although rape is the most pathogenic trauma experienced by South African women, followed by intimate partner violence, violence in an intimate relationship is a more important form of violence in terms of the actual percentage of South African women estimated to be suffering from PTSD (Kaminer et al., 2008).

Unfortunately the South African society is extremely tolerant to some forms of gender-based violence (CIET-Africa, 2000; Wood & Jewkes, 2001). Studies in 5 countries including South Africa, revealed that between 40% and 70% of female murders, were committed by an intimate partner (Krug et al., 2002). A systematic study by Gil-Gonzalez et al. (2006) revealed that the harmful use of alcohol by males increased the likelihood of intimate partner violence by 4.8 times when compared to non- or mild drinkers.

Intimate partner violence, including threats of physical harm, extreme jealousy, controlling behaviour, intimidation, chronic verbal harassment, withdrawal, endangering a partner, broken trust and degradation and physical and social isolation, all construct emotional/psychological abuse (Eyler et al., 1997). Intimate partner violence can also be described as lying on a continuum between slapping, hitting with sticks, pushing, persuading a woman to have sex, threatening to beat, assaulting with fists, and stabbing or shooting (Wood & Jewkes, 2001).

According to some literature, physical assaults may be more common in cohabiting relationships as opposed to marriage relationships (Yllo & Straus, 1981; Lane & Gwartney-Gibbs, 1985). Stets & Strauss (1989) also found that cohabiting couples are more likely to experience violence than those in dating or marital relationships. In a study by May et al. (2005) in a community in the Western Cape Province of South Africa, cohabiting was higher in women who had a child with FAS than women who didn't have a child with FAS. Most of these women lived in rural areas and were alcohol abusers.

Partner violence among South African women is significantly associated with problem drinking and past childhood trauma (in particular childhood sexual assault) (Jewkes et al., 2002; Wong et al., 2008; Dunkle et al., 2004). In a study by Brown & Stewart (2008) 18 women participated in a community-based treatment sample, self-reporting in qualitative interviews (open-ended semi-structured) about experiences of depression and co-existing alcohol use problems. The participants were recruited through an Addiction Prevention Treatment Service. Ten of these women reported that they were battered by a male partner or sexually assaulted after adolescence. These women had a history of traumatic life experiences which were followed by depression and the problematic use of alcohol. Some women were also sexually assaulted whilst they were under the influence of alcohol and others were assaulted by their drinking partners. An important theme in these women's stories was the experience of painful, difficult and abusive relationships and the presence of alcohol abuse and depression (Brown & Stewart, 2008).

Intimate partner violence may also increase a women's vulnerability to HIV/AIDS. Direct and indirect mechanisms are involved in the interaction between intimate partner violence and HIV/AIDS. Intimate partner violence may also prevent women from being tested for HIV/AIDS, prevent disclosure of their status or cause non-compliance with medication for HIV/AIDS (World Health Organization, 2004).

Vaginal trauma and lacerations may occur with coercive sex which results in a direct biological risk for HIV infection. A woman in a relationship where intimate partner violence is present may not be able to insist on condom use. Women who were sexually abused as children, experienced coerced sexual initiation, or are currently in a violent relationship, may start engaging in sexual risk taking behaviour.

The risk factors for intimate partner violence during pregnancy include pregnant women with a diagnosis of HIV, history of violence (e.g. women abused as a child) as well as alcohol and drug abuse either by the woman or her partner, occasionally or frequently (Shame et al., 2011). Negative health outcomes caused by intimate partner violence during pregnancy include preterm labour, low birth weight, miscarriage, complications with pregnancy, hypertension, stress and physical injuries (WHO, 2005; Campbell, 2002).

## **2.4 Other Psychopathologies in women**

### **2.4.1 Depression**

According to the DSM-IV-TR, American Psychiatric Association (2000), women are at significantly greater risk than men to develop major depressive disorder (MDD) than men. The following criteria must be met to diagnose a major depressive episode (DSM-IV-TR, American Psychiatric Association, 2000):

- A. Five or more of the following symptoms present during the same 2-week period and representing a change from previous functioning; at least one of which must be either 1) depressed mood or 2) loss of interest or pleasure.
  - 1) Depressed mood lasting most of the day, nearly every day, as indicated by either subjective report (e.g. feelings of sadness or emptiness) or observation by others (e.g. tearful appearance).

- 2) Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others).
  - 3) Significant weight loss when not dieting or weight gain (e.g. a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day.
  - 4) Insomnia or hypersomnia nearly every day.
  - 5) Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).
  - 6) Fatigue or loss of energy nearly every day.
  - 7) Feelings of worthlessness or excessive or inappropriate guilt nearly every day.
  - 8) Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).
  - 9) Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.
- B. The symptoms do not meet criteria for a Mixed Episode.
- C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The symptoms are not due to the direct physiological effects of a substance (e.g. a drug of abuse, a medication) or a general medical condition (e.g. hypothyroidism).

- E. The symptoms are not better accounted for by bereavement, i.e. after the loss of a loved one, the symptoms persist for longer than 2 months or are characterised by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Almost 70% of individuals with MDD and dysthymia are women (Weissman et al., 1991). Studies have shown that children are often raised in specific gender roles which may contribute to early psychological vulnerability in women and later to depression or anxiety (Chorpita & Barlow, 1998). According to Kocsis et al. (1990) women are more likely to self-medicate when they are experiencing depressive symptoms, ranging from dysthymia to the most severe form of depression. In a study by Brown and Stewart (2008) that was based on self-reports by 18 women, all 18 women in this community-based treatment sample reported histories of depression and 14 women reported that they were using antidepressants currently. It was evident that the women abused alcohol to relieve emotional pain and other trauma. The women's stories described depression as a profound sense of hopelessness, powerlessness, deprivation, lack of emotional and financial resources, self-contempt and isolation. According to the women's stories, they had a history of various forms of child abuse, abuse as adults, intimate relationship difficulties and struggling with poverty. This led to a poor self-esteem and inadequate coping skills which in turn led to drinking to self-medicate for depression (Brown and Stewart, 2008). Women who experience depression may be in a frame of mind where the self is subordinate, rejected and a passive victim in a hostile environment and their self-worth is devaluated (Horvath, 2008).

York and Horvarth (2008) reported in their study on a sample of rural women that stressful life circumstances contributed to these women's risk for depression, including abuse (e.g. physical abuse), stress related to parenting, problematic relationships and job-related stress. Whilst emotional pain or dissatisfaction with life often precedes alcohol abuse, the alcohol abuse in response causes problems. Suicide occurs more frequently among young women who drink alcohol (Lex, 1994). York and Horvath (2008) found situational stressors (stressful life circumstances) that are beyond individual control, to be a contributor to the development of depression among rural women. Women drink to cope with depression, but the long-term effect of alcohol abuse leads to problems that may reinforce their depression (Brown & Stewart, 2008).

Parker et al. (2010) studied the prevalence and characteristics of psychological distress and its association with self-reported current drinking problems among American Indian mothers whose children were referred to screening for FASD. They found a significant association between psychological distress and self-reported current drinking among these women. Kvigne et al. (2003) found that sexual abuse and mental health problems (mainly depression) were more evident in mothers of children with FAS than in mothers without a child with FAS.

## **2.5 Prevention and intervention in PTSD and trauma, domestic violence and depression**

### **2.5.1 PTSD and trauma**

Psychotherapy mainly focuses on helping the client to relive the traumatic event. The aim of reliving the event is to help the client develop coping skills to overcome the debilitating effect that the disorder has (Barlow & Lehman, 1996, Foa & Meadows, 1997, Keane & Barlow, 2002). Exposure therapy can also be effective in treating PTSD and prolonged exposure is even more effective when not used together with other cognitive-behavioural procedures such as stress inoculation training (Foa et al., 2002).

Dialectical behaviour therapy can also be used to treat PTSD. Mindfulness and distress tolerance are used with this therapy to deal with intrusive experiences like thoughts, memories, nightmares and flashbacks (Chapman et al., 2011). Nightmares are a common occurrence that develops after a person has witnessed or experienced a traumatic event. The frequency of nightmares may decrease when the person learns to regulate his emotions and lessen his experience of distress (Chapman et al., 2011).

Whilst nightmares occur when a person is sleeping, flashbacks occur when a person is awake. The person feels as if the traumatic event is happening all over again. Mindfulness skills are very effective in dealing with flashbacks or other intrusive experiences. It is recommended that women immediately receive psychological treatment after experiencing a traumatic event. By so doing, the development of PTSD can be avoided and the negative impact of the disorder can be reduced (Chapman et al., 2011).

### **2.5.2 Domestic violence**

According to the World Health Organization (WHO, 2004), the following multi-sectorial approaches can be used to address violence against women:

- 1) **Public Awareness:** Mass media and campaigns educating the public can raise awareness. The 16 days of Activism' campaign to end violence against women is an example of such a campaign (Center for Women's Global Leadership, 2004).
- 2) **Economic empowerment of women:** giving women more access to resources and improve poverty in households can also help reduce intimate partner violence. A study from Bangladesh provides evidence that partner violence can be reduced by micro-credit interventions (Schuler et al., 1996).
- 3) **Strengthening laws and policies:** Domestic policies that address domestic violence at the international treaties level, legislations and laws as well as institutions are very important.

South Africa is a developing country with an underdeveloped mental health system and it is important that programmes to prevent domestic violence and intervene, address the forms of violence that leads to the greatest mental health burden (Kaminer et al., 2008). According to Curnow (1995) the period directly after the woman was battered, constitutes a window period during which intervention is most

effective, as she is able to realise the effect of the battering. In a study by Joyner et al. (2007) with victims of domestic violence, it was evident that these individuals had high rates of depression and PTSD and that psychosocial intervention during the window period is very important.

The Men as Partners (MAP) programme in South Africa is an example of a strategy that gives adult education to target gender and sexual norms that may be an underlying cause of gender violence (WHO, 2004). The Stepping Stones intervention is another such strategy implemented in a number of countries in Africa (Welbourn, 1995; Shaw and Jawo, 2000). The Stepping Stones programme aims to work with the whole community in the belief that change will be more effective if there is involvement from all members of the community. It is a participatory training programme developed for rural communities to prevent HIV and aimed at giving participants more control over their sexual relationships and move towards gender egalitarian relationships. A total of 14 sessions with a duration of 2-3 hours each cover topics like relations between men and women, sex, love, sexual and reproductive health problems, HIV, STI's, why we behave in ways we do, grief/loss and dying, negotiation and assertiveness skills and gender-based violence (Welbourn, 1995; Shaw and Jawo, 2000). The Stepping Stones programme has been found to be effective in reducing the rates of intimate partner violence in South African communities (Jewkes et al, 2008).

### **2.5.3 Depression**

Treatment and prevention for women with alcohol abuse and depression should focus on childhood abuse, violence that they experienced in adulthood, and poverty (Brown & Stewart, 2008). More interventions should focus on effective coping skills, conflict management in interpersonal relationships and ways to meet emotional needs (Brown & Stewart, 2008). Their sense of self-worth must be addressed as well as effective ways to self sooth and comfort themselves. Dealing with loss and disappointment in a constructive manner also need attention.

According to Brown & Stewart (2008) the community should be educated about the link between alcohol abuse and depression and that the treatment for depression will most likely also require treatment for an alcohol abuse disorder and trauma. According to this study, instead of focusing on pathologising the problem, the narrative of the women's stories should rather be explored to identify the vicious cycle of depression and alcohol use.

The American Psychiatric Association recently updated their guidelines for treating depression (Armstrong, 2011). Treatment is categorised into an acute phase, continuation phase, maintenance phase and discontinuation phase. In the acute phase the following are important:

- The objective with patients in the acute phase should be to return them to baseline functioning
- Mild or moderate depression should be treated with pharmacotherapy or psychotherapy
- A combination of pharmacotherapy and psychotherapy can be considered when one of the following is present: psychosocial or interpersonal conflict; axis II diagnosis or intra-psychic conflict.
- Electro Convulsive Therapy (ECT) can be considered in selected patients
- In patients with severe depression without psychotic features, pharmacotherapy, or a combination of pharmacotherapy and psychotherapy are recommended and ECT should be considered when necessary. Psychotherapy should not be used alone.
- In patients with a diagnosis of severe depression with psychotic features, antidepressants with antipsychotic agents should be used. Psychotherapy can be combined with the pharmacotherapy. ECT should be considered when indicated.

The continuation phase focuses on relapse prevention (Armstrong, 2011). The following aspects must be considered:

- Adverse effects of medication should be monitored
- Adherence to therapy should be assessed
- Level of functionality should be evaluated

- In the case of successful pharmacotherapy, medication should be continued at the same dosage for 4-9 months
- Cognitive behaviour therapy focused on dealing with the depression, should also continue during this phase
- Continuation ECT can be considered if pharmacotherapy and psychotherapy are ineffective

The maintenance phase applies to patients that have a history of 3 or more depressive episodes or chronic MDD. Where other risk factors for recurrence are present (residual symptoms, early age of onset, psychosocial stressors) therapy should continue. Regular monitoring during this phase is important. The type of treatment, adverse effects, detail of previous depressive episodes, co-morbid diagnoses and the presence of depressive symptoms after recovery, should also be taken into consideration (Armstrong, 2011). If pharmacotherapy was used during the acute and continuation phase, the full dosage should be continued during the maintenance phase.

Where psychotherapy was used during the acute and continuation phase, less frequent sessions should take place during the maintenance phase. ECT can be considered in cases where treatment with pharmacotherapy or psychotherapy was unsuccessful.

During the discontinuation phase, the tapering of pharmacotherapy should take place over a period of several weeks. The potential for relapse should be discussed with the patient and a treatment plan to

prevent relapse should be developed. Monitoring of patients after discontinuation is important and if symptoms reoccur, another phase of acute treatment is indicated (Armstrong, 2011).

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## **CHAPTER 3**

### **MATERNAL DRINKING AND FASD**

This chapter contains information about alcohol dependence in women, maternal drinking in HIV positive women, drinking behaviours that can cause FASD, consequences for the drinking mother and prevention and intervention of alcohol abuse in high risk women.

#### **3.1 Alcohol dependence in women**

According to the DSM IV-TR (APA, 2000) alcohol use disorders (alcohol abuse and dependence) are maladaptive patterns of alcohol consumption manifested by symptoms leading to clinically significant impairment or distress. Motor vehicle accidents, poor adherence to medication, domestic violence, fetal alcohol syndrome, financial costs and low productivity, neuropsychological impairment and psychiatric co-morbidity are all associated with alcohol abuse and dependence (Hasin et al., 2002). When alcohol abuse is left untreated the result is often impaired functioning and more stressful life events. This increases the risk of other psychopathologies such as major depression (Hasin & Grant, 2007).

Three of the following criteria must be present occurring at any time in the same 12 month period to make the diagnosis of alcohol dependence:

1) Tolerance, or as defined by either of the following:

- a) A need or markedly increased amounts of the substance to achieve intoxication or desired effect
  - b) Markedly diminished effect with continued use of the same amount of the substance
- 2) Withdrawal, as manifested by either of the following:
- a) The characteristic withdrawal syndrome for the substance
  - b) The same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms
- 3) The substance is often taken in larger amounts or over a longer period than was intended
- 4) There is a persistent desire or unsuccessful efforts to cut down or control substance use
- 5) A great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use the substance (e.g. chain- smoking), or recover from its effects
- 6) Important social, occupational, or recreational activities are given up or reduced because of substance use
- 7) The substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g. continued drinking despite recognition that an ulcer was made worse by alcohol consumption)

The following criteria must be present to diagnose substance abuse according to the DSM IV-TR (APA, 2000):

- A) A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one or more of the following, occurring within a 12-month period:

- 1) Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g. repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household)
  - 2) Recurrent substance use in situations in which it is physically hazardous (e.g. driving an automobile or operating a machine when impaired by substance use)
  - 3) Recurrent substance-related legal problems (e.g. arrests for substance-related disorderly conduct)
  - 4) Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g. arguments with spouse about consequences of intoxication, physical fights)
- B) The symptoms have never met the criteria for Substance Dependence for this class of substance.

It is evident from the high rates of FAS that women in several communities in South Africa abuse alcohol (Viljoen et al., 2005). The country has one of the highest consumption rates of alcohol per drinker compared to anywhere in the world (Parry et al., 2005; Peltzer and Ramlagan, 2009).

Approximately 30% of South African women consume alcohol (Rehm et al., 2003). In the Western Cape it is estimated that 34% of urban women and 46-51% of rural women drink during pregnancy (May et al., 2005). According to the South African Demographic Health survey of 1998, 1 in 10 women

experience symptoms associated with alcohol problems at some stage during their life (Parry et al., 2005). The survey also found that poor women and women with limited education, experience a significant increase in lifetime alcohol related problems, and that one third of male and female drinkers took part in high levels of drinking that were considered as a risk (Parry et al., 2005).

The possible cause of these problems among women in South Africa must be addressed. Self-medication by women may be used as a method to manage or to lessen emotional suffering or pain (Khantzian, 1985). Alcohol may also be used by these women as a way to deal with stressors in their lives (Sawyer et al., 2006). Women who abuse alcohol experience more physical and sexual abuse than women who do not and the prevalence of other mental disorders is also more common in these women (Beckman, 1994; Bassuk et al., 1998). Research has shown that women are more likely than men to drink when they are depressed (Helzer & Pryzbeck, 1988). According to Kocsis, Markowitz & Prien (1990), women tend to self-medicate by using alcohol in response to the whole spectrum of depressive syndromes, including dysthymia. In a study by Brown & Stewart (2008), women reported that they use alcohol to cope with stress, feelings of powerlessness and dissatisfaction, and abuse in relationships with men. These women self-medicated with alcohol to deal with the depression that was caused by negative life experiences that led to a low self-esteem, but in the long term the alcohol reinforced their depression due to the problems that their drinking caused. It may also be argued that depression is not the cause but rather the result of chronic alcohol abuse (Schuckit et al., 1997).

Alcohol disorders are often co-morbid with other psychiatric disorders. In a study that examined past year diagnosis (and excluded substance-induced disorders) of the US population, Grant et al. (2004) found that the risk of mood and anxiety disorders were 2.6 and 1.7 times higher in persons with alcohol abuse or dependence than in persons without an Alcohol Use Disorder.

### **3.2 Maternal drinking in HIV positive women**

Women who drink may engage in sexual risk taking behaviour and by so doing, they are at risk of contracting HIV (Morojele et al., 2006; Baliunas et al., 2010; Hahn et al., 2011; Fisher et al., 2007; Parry et al., 2009; Shuper et al., 2010). According to international estimates, South Africa has the highest HIV rate. In 2009 it was estimated that 5.6 million South Africans were infected with HIV (UNAIDS, 2010). A study by Desmond et al. (2011) in the Kwazulu-Natal Province of South Africa, reported a higher prevalence of drinking amongst HIV infected women than those without HIV. Of the women in the study, 18% reported that they drank during pregnancy and 67% reported binge drinking episodes. One third of these pregnant women binged twice or more times per month (Desmond et al., 2011).

### **3.3 Drinking behaviours of women that can cause FASD**

Animal studies have found that although FASD is more likely caused by higher levels of alcohol consumption than lower levels, even a single exposure of infant rats or mice to ethanol during synaptogenesis (equivalent to mid to late pregnancy in humans) can lead to apoptosis (programmed cell death) in developing neurons (Olney, 2004). Maier and West (2001) found through animal studies that

binge-like drinking is the most harmful to the developing fetus. Several studies have confirmed the same effect in humans (West & Goodlett, 1990; Maier & West, 2001; Viljoen et al., 2002; May et al., 2005). Binge drinking, when a high number of drinks is consumed on a single occasion, leads to high blood alcohol concentration (BAC) and presents a greater risk factor for the developing fetus than daily drinking. Any alcohol consumption during pregnancy should be avoided, as it can't be said with certainty how much damage a single drink can cause during a specific period of the development of the fetus. Jacobson et al. (2003) found that infants had deficits in performance if the mother drank 5 standard drinks per occasion once a week. Unfortunately women in the study communities of the Western Cape often binge drink in groups of 3-4 specifically over weekends (London et al., 1998; May & Gossage, 2004). Strandberg-Larsen et al. ((2008) found that women in the recognition stage of pregnancy who continued to binge drink, were likely to have an unwanted pregnancy. Women who have been unemployed for more than 12 months or are unskilled, were more likely to binge drink in the recognition stage of pregnancy. It was further found that binge drinking in the recognition stage of pregnancy correlated with the self-reported presence of a mental disorder or neurosis (Strandberg-Larsen, 2008).

Besides binge drinking that cause peak blood alcohol concentration, the metabolic activity of the mother can also influence these peak levels. Women who give birth to a child with FAS may be metabolising alcohol at a different level than mothers who also drink but without affecting the unborn child (Khaole et al., 2004). Women who have polymorphism in the gene for the ADH enzyme, have faster metabolic

rates and a lower prevalence of alcohol-related birth defects (McCarver, 1997). Khaole et al. (2004) studied alcohol metabolisation in 10 mothers FAS children, in comparison with 20 mothers whose children did not present with FAS (controls). In a voluntary session the women could drink any beverage of their choice in a 2.5h period. Their drinking was terminated if the breath alcohol concentration went over 150 mg %. FAS mothers drank more in the 2.5h session than the controls and the FAS mothers' breath alcohol concentration was higher.

Possible demographic characteristics have been identified in women abusing alcohol in South Africa. A study by Ojo et al. (2010) used cross-sectional household surveys to assess and compare the extent of high-risk drinking and factors associated with high-risk drinking in the adult female population of a rural and urban region in South Africa. The setting was a rural wine farming area in the Western Cape and an urban site in Gauteng. The women in the study were between the ages of 18-44 years. Only 20% of the respondents in Gauteng were high-risk drinkers compared to 64% of the respondents in the Western Cape. Beer and 'papsak' wine was significantly associated with high-risk drinking in the Western Cape. Brew and beer were associated with high-risk drinking in Gauteng. Women in Gauteng were more likely to drink ciders and coolers. A higher educational level, the household never or seldom going hungry, and employment were contrariwise associated with high-risk drinking in Gauteng. The presence of more household amenities was inversely associated with high-risk drinking at both sites (Ojo et al., 2010). Consumption of alcohol after the age of 18 was a protective factor for high-risk drinking at the Gauteng site. Current smoking and having experimented with cigarettes were associated with high-risk drinking

at both sites. Respondents at both sites, who had one or more family members with an alcohol problem, were more likely to engage in high-risk drinking (Ojo et al., 2010).

### **3.4 Consequences for the drinking mother**

In a study by Kvigne et al. (2003) it was found that mothers of FAS children have more alcohol related health problems and that trauma, delirium tremens and alcohol abuse were more frequently reported by these mothers. Another serious consequence of alcohol dependence is liver problems. It was found that women might not recover from liver malfunction when they stop drinking or reduce their alcohol intake compared to men that might recover (Deal & Gravalier, 1994). Injuries that occur when under the influence of alcohol are another concern. Kvigne et al. (2003) found that mothers who had a child with FAS were 3 times more likely to seek treatment for unintentional injuries and 6 times more likely to receive care for intentional injuries.

Co-morbid psychiatric disorders are often present with alcohol use disorders. According to a study by Dawson et al. (2005), people who abuse alcohol have a higher risk for mood, anxiety and personality disorders. The study found that even people who had not engaged in binge drinking the past 12 months, had a 50% higher risk to develop a mood or anxiety disorder or any personality disorder when abusing alcohol. Kvigne et al. (2003) confirmed that mental health problems and sexual abuse were more often recorded in mothers that had a child with FAS. Such mothers' mood or anxiety might further be

influenced by the possibility of later born children with more severe effects of FAS (Stratton et al., 1996).

### **3.5 Prevention and intervention of Alcohol Abuse in high risk women**

The Institute of Medicine's Model (Stratton et al., 1996) for prevention of FASD addresses the following:

- 1) Universal Prevention - policy interventions and education should take place at the community level.
- 2) Selective Prevention - women of child-bearing age should be screened for alcohol abuse and messages should target specific women.
- 3) Indicated Prevention - interventions should take place with women who already have a child diagnosed with FAS or FASD and women who are known to drink heavily during pregnancy.

Grant & Dawson (1996) worked with mothers who had an established pattern of substance abuse. The aim of their intervention for the mother was to help them get substance and alcohol treatment, help them stay in recovery and address problems that they experience because of their often chaotic life style (poor housing, domestic violence, problems with children in custody, legal issues). The aim of the intervention for the children was to make sure that their environment at home is safe and that they have access to health care on a regular basis. Paraprofessional advocates worked with a case load of up to 15 clients and their families from the time that the target child is born until the child is 3 years old. The advocate

did the following: assist women to identify their personal goals and steps that are necessary to reach them, put women in contact with services and resources that might be needed, and offer guidance, support and keep an eye on them.

The following strategies were used to help the clients reach their goals in the 3 year time frame:

- developing trust and bonding with the client through contact and home visits on a regular basis
- developing a strong communication network among professionals to assist the client (nurses, social workers etc.)
- written contracts stating the responsibility of the client and the time frames
- teaching of basic life skills and modeling of social and parenting behaviour
- establishing close communication with the client's family, partner and neighbour
- providing transportation and child care when the client has an important appointment
- supervision of advocates and regular staff meetings

According to May et al. (2008) prevention should be formal and active, specifically in the rural areas.

Social improvement, proven case management techniques, birth control and alcohol treatment can improve risk factors associated with maternal drinking.

May et al. (2007) argues that it is possible to implement case management with high risk women as part of a prevention programme, although it could be challenging in a rural community. All women of childbearing age should be referred for treatment if they have problems associated with substance abuse, for example depression, injuries and sexual abuse. There is a greater need for intervention when a

woman already has a child with FAS. Standardised screening tools should be used and protocols for referrals should be in place (Kvigne et al., 2003).

Women need to learn coping skills and skills in self-care instead of using alcohol to self-medicate (Brown & Stewart, 2008). According to Stewart et al. (2005) risky drinking and problems with drinking improve when feelings of hopelessness are addressed in young people. Psychopathology should also be addressed together with the alcohol abuse (Dawson et al., 2005).

Another valuable programme for women who are treatment-resistant is the Community Reinforcement and Family Training (CRAFT). The programme was developed by using scientifically validated behavioural principles that aim to reduce the significant others' substance abuse and encourage them to seek treatment (Meyers & Wolfe, 2004). This programme showed a 64 % success rate in a study by Miller, Meyers and Tonigan (1999). In this study the CRAFT was compared with a programme that substance abusers would traditionally receive from groups like Al-Anon and with a programme where the family confronted the drinker and hoped that they could get him/her to enter formal treatment. In contrast to these programmes, the CRAFT programme focused on teaching the significant others new strategies to guide the drinker into treatment and aimed to help the family members take care of their own needs. The CRAFT worked with 'behavioural mapping', which describes the pattern in which family members affect each other and possible ways of improving the outcome. In the CRAFT study, depression, anger, family conflict and relationship issues were also measured. After 3 and 6 months

follow-up, the problem drinkers were less depressed, less angry and had improved family cohesion and relationships (Miller, Meyers & Tonigan, 1999). CRAFT was also shown to be effective with individuals who abused drugs but were treatment-resistant (Meyers et al., 2002).

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## **CHAPTER 4**

### **FETAL ALCOHOL SYNDROME DISORDERS**

#### **2.1 Introduction**

The chapter provides information about the term FASD, the prevalence of FASD in the Western Cape Province, and the consequences for the child with FASD as well as risk factors for women with regard to FASD.

#### **2.2 Epidemiology of FASD**

Fetal Alcohol Spectrum Disorders (FASD) is caused by excessive alcohol consumption during pregnancy. Fetal Alcohol Syndrome (FAS) is the term used for the most severe symptoms caused by maternal drinking. It is the most clinically recognisable form of FASD. Minor facial anomalies, prenatal and postnatal growth retardation, and functional or structural central nervous system abnormalities are the criteria used to diagnose FAS (Stratton et al., 1996).

Different levels of exposure measured by quantity, frequency and timing of alcohol consumption are associated with degrees of severity (May, 1995). The new terminology that is used to describe fetal alcohol effects includes the terms alcohol-related neurodevelopmental disorder and alcohol-related birth defects (Stratton et al., 1996).

FASD is the term used for FAS with the most severe effects, Partial FAS (PFAS), Alcohol Related Birth Defects (ARBD) and Alcohol Related Neurological Defects (ARND).

The following IOM criteria are used to diagnose FAS (Hoyme et al., 2005):

- A. Confirmed maternal alcohol exposure
- B. Evidence of a characteristic pattern of minor facial anomalies, including  $\geq 2$  of the following:
  - 1. Short palpebral fissures
  - 2. Thin vermilion border of the upper lip
  - 3. Smooth philtrum
- C. Evidence of prenatal and/or postnatal growth retardation  
Height or weight  $\leq 10^{\text{th}}$  percentile
- D. Evidence of deficient brain growth or abnormal morphogenesis, including  $1 \geq$  of the following:
  - 1. Structural brain abnormalities
  - 2. Head circumference  $\leq 10^{\text{th}}$  percentile

The following criteria are used to diagnose Partial FAS:

- A. Confirmed maternal alcohol exposure
- B. Evidence of a characteristic pattern of minor facial anomalies, including  $\geq 2$  of the following:
  - 1. Short palpebral fissures

2. Thin vermilion border of the upper lip
  3. Smooth philtrum
- C. One of the following other characteristics:
1. Evidence of prenatal and/or postnatal growth retardation in  
Height or weight  $\leq 10^{\text{th}}$  percentile
  2. Evidence of deficient brain growth or abnormal morphogenesis, including  $\geq 1$  of the following:
    - a) Structural brain abnormalities
    - b) Head circumference  $\leq 10^{\text{th}}$  percentile
  3. Evidence of a complex pattern of behavioural or cognitive abnormalities inconsistent with developmental level that cannot be explained by genetic predisposition, family background, or environment alone. This pattern includes marked impairment in the performance of complex tasks (complex problem solving, planning, judgment, abstraction, metacognition, and arithmetic tasks); higher-level receptive and expressive language deficits; and disordered behaviour (difficulties in personal manner, emotional lability, motor dysfunction, poor academic performance, and deficient social interaction)

The following criteria are used to diagnose ARBD:

- A. Confirmed maternal alcohol exposure.

B. Evidence of a characteristic pattern of minor facial anomalies, including  $\geq 2$  of the following:

1. Short palpebral fissures
2. Thin vermilion border
3. Smooth philtrum

C. Congenital structural defects in  $\geq$  of the following categories, including malformations and dysplasias (if the patient displays minor anomalies only,  $\geq 2$  of the following must be present):

1. Cardiac: atrial septal defects, aberrant great vessels, ventricular septal defects, conotruncal heart defects
2. Skeletal: radio ulnar synostosis, vertebral segmentation defects, large joint contractures, scoliosis,
3. Renal: aplastic/hypoplastic/dysplastic kidneys, 'horseshoe' kidneys/ureteral duplications
4. Eyes: strabismus, ptosis, retinal vascular anomalies, optic nerve hypoplasia
5. Ears: conductive hearing loss, neurosensory hearing loss,
6. Minor anomalies: hypoplastic nails, short fifth digits, clinodactyly of fifth fingers, pectus carinatum/excavatum, camptodactyly, 'hockey stick' palmar creases, refractive errors, 'railroad track' ears

The following criteria are used to diagnose ARND:

- A. Confirmed maternal alcohol exposure
- B. At least 1 of the following:
  - 1. Evidence of deficient brain growth or abnormal morphogenesis, including  $\geq 1$  of the following:
    - a) Structural brain abnormalities
    - b) Head circumference  $\leq 10^{\text{th}}$  percentile
  - 2. Evidence of a complex pattern of behavioural or cognitive abnormalities inconsistent with developmental level that cannot be explained by genetic predisposition, family background, or environment alone.

This pattern includes marked impairment in the performance of complex tasks (complex problem solving, planning, judgment, abstraction, metacognition, and arithmetic tasks); higher-level receptive and expressive language deficits; and disordered behaviour (difficulties in personal manner, emotional lability, motor dysfunction, poor academic performance, and deficient social interaction).

### **4.3 FASD in the Western Cape Province of South Africa**

A study by Urban et al. (2008), conducted with the De Aar and Upington communities in the Northern Cape Province of South Africa, yielded a FAS prevalence rate of 67.2 per 1000 and a PFAS prevalence of 20.8 per 1000. In this study Grade I pupils were screened.

The prevalence of FASD in the Western Cape is worrying. In 2000 May et al. found that 40.5 to 46.4 per 1000 children aged 5 to 9 years, had a FASD diagnosis. In a subsequent study (May et al., 2007), 818 Grade I children in the Western Cape Province were examined for FASD. Of these, 55 children received a final diagnosis of FAS, 18 received a final diagnosis of PFAS and 2 children were deferred because they could not be located for testing. The prevalence of FAS was 89.2 per 1000. This rate is the highest rate reported in the world (May et al., 2007). Mothers in these communities have a very high sense of denial that they use as defense mechanism when pregnant (Campbell, 2007). Some of these mothers also have FAS themselves and they are thus unable to identify the debilitating disorder in their children because of their impaired cognitive functioning (Connor & Streissguth, 1996).

### **4.4 Consequences for the child**

The main preventable cause of mental retardation in the United States is FAS (Sokol et al., 1989). The same can be argued for South Africa. The impairment caused by FAS is life-long and the behavioural and learning difficulties are often the greatest challenge (Wattendorf & Muenke, 2005). Individuals with FAS have several behavioural problems, which are viewed as a secondary disability in prenatally

alcohol-exposed children (Streissguth et al., 1991; 1996). It has also been recorded that biological parents and foster parents experience higher stress levels with a child that has been exposed to alcohol prenatally, compared to children that have not been exposed to alcohol (Griffith et al., 1994).

Steinhausen et al. (1993) suggested that children and adolescents with FAS or milder fetal alcohol effects, experience psychiatric problems even if there is no evidence of intellectual disability.

Individuals with FAS and fetal alcohol effects may suffer from mental illness as they get older (Famy et al., 1998). In their study with 25 FASD individuals, 23 received an axis I diagnosis (all of the various psychological/psychiatric disorders, except personality disorders and intellectual disability), 15 received a diagnosis of past or present substance dependence and 8 a diagnosis of past or present major depressive episode. Ten subjects had a psychotic disorder, with brief psychotic episode the most common disorder (Famy et al., 1998). Children diagnosed with FASD find it difficult to respond to social cues and their social behaviour and social skills are often impaired (Streissguth, 1997). Research has found that these social problems sadly continue into adulthood (Carmichael-Olson et al., 1998).

Mathematical functioning deficits have also been reported in individuals affected by alcohol (Coles et al., 1991; Jacobson et al., 2003; Streissguth et al., 1996). These deficits continue through adulthood (Kopera-Frye, Dehaene, & Streissguth, 1996). Streissguth et al. (2004) found among those with FASD, a high prevalence of mental health problems, disorganised school experiences, alcohol and other substance abuse, and sexual behaviour that is considered as inappropriate and a violation of laws.

#### **4.5 Maternal risk factors for FASD**

According to epidemiological studies, the following contributing factors increase the risk for FASD: older maternal age, high parity, lower socio-economic status, maternal drinking patterns, African-American ethnicity, genetic factors, poor nutrition and maternal alcohol metabolism (Sokol et al., 1986; Ernhart et al., 1987; West et al., 1990; Abel, 1995; Maier & West, 2001; Warren & Foudin, 2001). May et al. (2005) compared 53 mothers with a child that had FAS (case mothers) with 116 mothers without a child with FAS (control mothers), using questionnaires specifically designed for the community. The case mothers had fewer social resources like education, spirituality or income. Gravidity and parity was a risk and it was more likely that case mothers had a male partner without being married and had family, friends and sexual partners who abused alcohol. It was also found that case mothers consumed more alcohol than control mothers. Case mothers reported stressful life events as reasons for drinking. The case mothers had poor nutrition and they were on average smaller in height, weight and head circumference. According to this study some of the case mothers appeared to have FASD themselves and their alcohol abuse might also be worsened by their lack of judgment and impulsivity.

In a later study by May et al. (2008) in a town and surrounding rural areas in the Western Cape, 72 first grade mothers that had a child with FAS or PFAS were compared with 134 randomly selected mothers without a child with a diagnosis of FAS or PFAS, using interviews and collateral data. The following risk factors were identified and confirmed those from other studies:

- 1) Lower socio-economic status.
- 2) Lower socio-economic status and few social resources.
- 3) Higher gravidity (higher maternal age) and parity (later borne children are more affected).
- 4) Cohabiting, extended families, sexual partners, and friends who drank heavily.
- 5) Binge drinking- alcohol usage high in frequency, quantity and duration.

Poor life-long and current nutrition, multiple generations of fetal alcohol exposure and genetic influences can contribute to the high rate of FAS and PFAS according to May et al. (2008). They also found that mothers who had children with FAS or PFAS had a lower weight and BMI (body mass index). This might be a physiological effect and also seen as evidence that poor maternal nutrition increases the risk for FASD (Badger et al., 2005; Khaole et al., 2004; Sokol et al., 1986; Thomas et al., 2004; Abel, 1998; Shankar et al., 2007). In a study by Desmond et al. (2011) in the KwaZulu-Natal Province of South Africa, it was found that increased social activity was a risk factor for alcohol use amongst HIV positive pregnant woman. Women who attended community meetings and often socialised with family and friends, were more likely to drink. In a study to identify maternal risk factors for FAS in South Africa, physical assault was more prevalent among mothers of FAS and PFAS children (May et al., 2008).

#### **4.6 Prevention and intervention of children diagnosed with FAS or FASD**

A holistic approach is necessary to prevent the dreaded development of FAS. No single intervention strategy however, will be able to eradicate the misuse of alcohol (Parry & Bennets, 1998). Some suggestions include birth control, pre-natal screening for alcohol abuse and improvement of social conditions (Viljoen et al., 2005).

It is very important that intervention for children diagnosed with FAS or FASD starts as early as possible (Streissguth et al., 1996). Five protective factors for children with a diagnosis of FASD are identified by Streissguth et al. (2004), including living in a stable home with good quality, little changes in living arrangements, receiving help from services for developmental disabilities, no exposure to violence and receiving a diagnosis before the age of 6. According to Adnams et al. (2007), children with FASD may benefit from cognitive intervention aimed at improving specific skills. In their study where a programme targeted at literacy and linguistic skills was administered to FASD children, significant gains were made over FASD controls.

Bertrand (2009) reported on five studies of interventions for children with FASD:

In one study aimed at improving the social skills of children with FASD, a social skills training programme was administered to children aged 6-12. The following skills were taught:

- a) Social network formation
- b) Informational interchange with peers leading to a common-ground activity
- c) Entry into a group of children already in play
- d) In-home play dates
- e) Conflict avoidance and negotiation.

These skills were taught through simple rules of social behaviour, modeling, and rehearsal, rehearsal at home, feed-back during treatment sessions, homework assignments and coaching by parents during play with children. Children who went through this programme showed a better knowledge of appropriate social behaviour.

The second study was aimed at improving the behavioural and mathematical functioning of alcohol-affected children by administering a socio-cognitive habilitation programme. Individual instructions were given to each child and caregivers and teachers were trained. Mathematical concepts had to be taught in a school, as well as therapeutic and home environments. FAS and PFAS children aged 3-10 were involved in this study. Results showed that the children benefited from this programme.

The third study was a neurocognitive habilitation programme for improving self-regulation. This programme was adapted from the Alert Programme (Williams & Shellenberger, 1996) that uses a car

engine as a metaphor to bring across the concept of self-regulation to children. The programme had 3 stages:

- a) Teaching children skills to identify engine speed
- b) Providing children with strategies to change their engine speed to the desired speed
- c) Regulate their state of arousal by learning to monitor sensorimotor input. The results showed that children who were involved in this programme, displayed significant improvement in executive functioning skills.

The fourth study evaluated two interventions for FASD to address behavioural problems in children with FASD and reduce the stress experienced by their caregivers. According to the literature, programmes that address inappropriate behaviour of children affected by FASD is of great significance, because this negative behaviour affects the wellbeing of both child and caregiver (Streissguth et al., 1996; Bertrand et al., 2004).

The first intervention was the Parent-Child Interaction Therapy (PCIT) (Eyberg & Boggs, 1998), an evidence-based behavioural parent training treatment, giving parents and children live coaching practice of behavioural parenting skills. PCIT is a short-term intervention, consisting of between 12-16 sessions, with the following goals:

- to improve the relationship between parent and child
- to acquire appropriate social skills
- to minimise inappropriate behaviours
- to establish a positive system of discipline.

Research has shown that, in children who went through the PCIT programme, conduct problems decreased and self-esteem improved (Eisenstadt et al., 1993). Bertrand (2009) echoed the usefulness of PCIT to address behaviour and learning problems in a child with FASD with brain damage.

The second intervention, the Parenting Support and Management (PSM) programme focused on the parents only and had components of other behavioural programmes incorporated (Barkley, 1997; Webster-Stratton, 2001).

In the results of this study with the 2 intervention programmes, it was found that in both groups the children's behavioural problems improved over time. The PSM also showed improvement in behavioural problems, and it might be more cost-effective as it requires less effort. Both intervention programmes have been found to be effective.

The fifth study focused on the family and their needs in raising a child with FASD. This is known as the Families Moving Forward Programme (FMF). The programme was developed to work on parent's attitudes and responses towards their child's behaviour that might be problematic. The aim of the

programme was to reduce difficult behaviour and to improve outcomes during school years. Different empirically supported techniques for children and parents were utilised in this programme (Kleinfeld & Westcott, 1993; Streissguth, 1997; Kalberg & Buckley, 2007).

The FMF intervention programme aims at improving the self-efficacy of parents, meeting the family's needs, reducing the stress caused by the child, changing parents' knowledge and behaviour, and decrease difficult and challenging behaviour. The study showed that the model is feasible and effective for children with FASD and their parents.

The coaching families (CF) programme is a family intervention programme that assists parents and caregivers who raise children with FASD (Leenaars et al., 2011). Programme mentors provide the families with information about FASD, help them access resources and advocate on their behalf. Leenaars et al. (2011) analysed retrospective data from 186 families from pre- to post-programme phases. A strong relationship between mentors and the families is essential in order to help them identify strengths, accessing support from the community and examining supports from the family. There was a significant increase in goal-attainment amongst the caregivers from pre-to post-programme, and a decrease in needs. The needs that showed the greatest decrease from pre-to post-programme are housing and transportation, family parenting, community development and community resources. The stress experienced by caregivers also significantly decreased from pre-to post-programme. Families reported that they were highly satisfied by the results of the coaching families programme (Leenaars et al., 2011).

Programmes like the CF, is successful in addressing a variety of needs and goals within the family where there is a child with a diagnosis of FASD (Leenaars, et al., 2011).

Intervention with high risk and drinking mothers is also important. FAS researchers agree that micro-level intervention is necessary in South Africa that is person-centered, supportive and non-confrontational and that addresses the alcohol consumption of the women (Olson et al., 2000; De Waal, 2010). The intervention should focus on the following: safe sexual interaction, family planning (contraception), change of drinking behaviours, improving nutrition and focus on trauma and stressful life events in the specific communities (McKinstry, 2005; Bates et al., 2002; Emmans & Rollnick, 2001). According to Jansen van Vuuren (2012), no single strategy will relieve the burden of alcohol abuse that leads to FASD, but there is hope, with the combination of CBT and Motivational Interviewing applied as tools, to address the problems caused by drinking.

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## **CHAPTER 5**

### **METHODOLOGY**

The present study is a nested study within a large, overarching study. The main study is an efficacy trial, modeled on the IOM report on FAS, contains aspects of both pre-intervention and intervention research. It focuses on universal prevention, selective prevention and indicated prevention. In three waves at intervals of 1, 3 and 5 years, a total of 2304 adults in the experimental and control communities were asked to provide self-report information regarding their knowledge and usage of alcohol, tobacco, other drugs and HIV/AIDS, including their attitudes towards and beliefs around these issues. Approximately 2000 children in experimental schools were screened for FASD.

The main study interviewed 209 community members in BRAM and 384 in Wellington as well as 349 mothers of Grade 1 learners in Wellington in 2008 and 498 mothers in 2010. In the BRAM area 662 mothers of Grade 1 learners were interviewed in 2009 and 483 mothers in BRAM in 2011. A total of 73 women enrolled for Case Management in Wellington (intervention site) and were followed up at 6 months, 12 months and 18 months.

#### **5.1 Study Sample**

For this nested study, different samples of women were recruited via the community survey, maternal questionnaires and case management (Table 18 and 19):

i) The main study comprised a simple, random sample of adults (16+yrs) living in rural and urban areas of the two communities. Individual respondents were selected randomly from voter registries and clinic records (virtually all health care is public). Sample size for each of the communities was calculated on an estimate, ensuring accuracy within 5% of true prevalence (95% C.I.) for populations of an undetermined (any) size.

The data upon which the power analyses were based, originated from the following resources: (i) FAS cases predicted were from an average rate of FAS diagnoses from Waves I and II of the Wellington studies - 59.3 per 1000 children; (ii) The number of births from official 2001 population projections made by the South African Census Bureau for Wellington and BRAM and the average crude fertility rate for 1999 and 2000 - 21.5 per 1000 children; (iii) the estimated number of children in first grade in both prevention and comparative communities based on school enrollment in Wellington waves I-III projected proportionally to years 2010 for Wellington and Robertson areas. The total sample error rate was <3% in each wave for both community areas combined. In previous study waves in these communities, the refusal rates of maternal risk surveys was very low (<2%), and minimal problems of refusal in this survey were expected.

Conservative estimations projected 64 new cases from 1077 births each year in Wellington (prevention) and 70 cases per year from 1176 births in Robertson (comparative) if there was no effect from

prevention. With a reduction of 0.02 (non-response), 42.4 FAS births in Wellington per year were predicted.

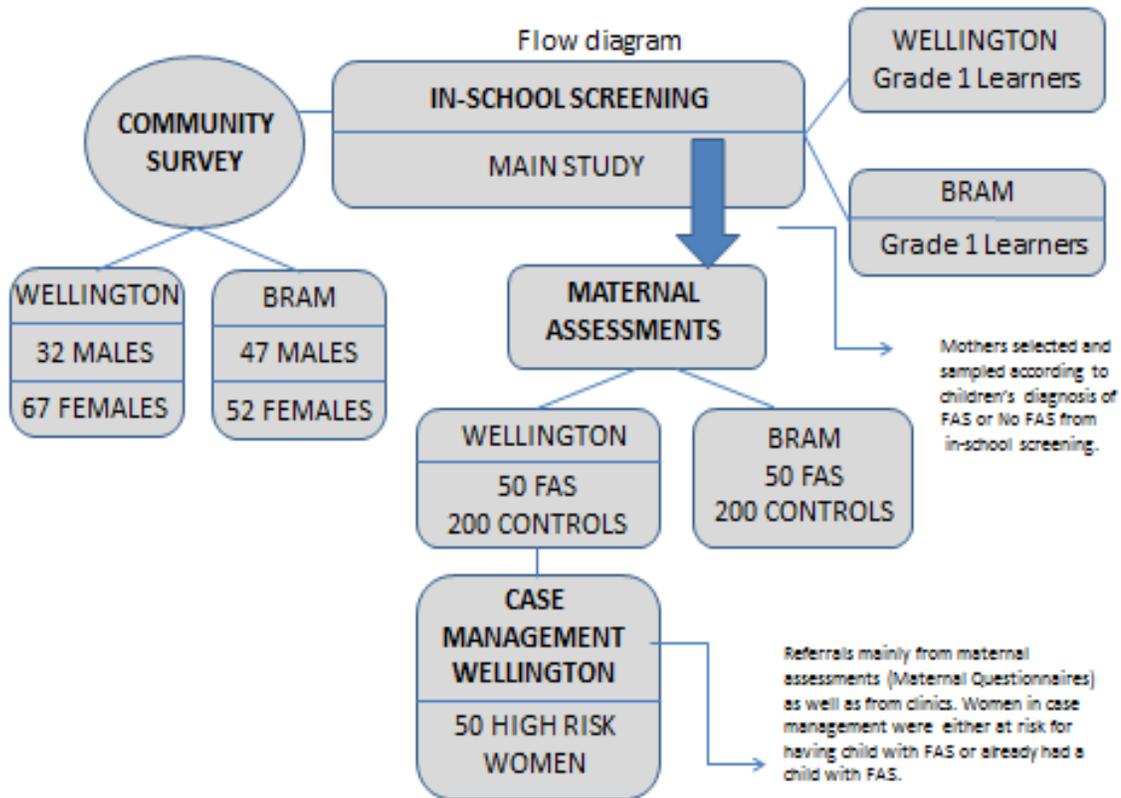
(ii) The two communities, both in the Western Cape Province of South Africa, share many similarities. The prevention community (Wellington) for the main study belongs to the Drakenstein Municipality of the Winelands area, along with a larger city, Paarl. The population of Wellington was estimated in the 2001 Census at 18,341 with 22% being rural and very poor. The major economy revolves around fruit production, wine making and light industries. Robertson, Ashton, Bonnievale and Montagu (comparative communities) lie across a high mountain range, 60 kilometers away from Wellington. The population of the Robertson area was 51,978 (31% rural) and also very poor. Similar to the Wellington area, the economy is also based on fruit and wine. Whereas there were 13 primary schools in Wellington, the BRAM area had 45 primary schools.

## **5.2 Study Design**

This study was a nested study of the 5 year Fetal Alcohol Syndrome Epidemiological Research study, which started in 2008 and was conducted in the Wellington (main prevention site) and BRAM areas (comparative sites). The nested study was a cross-sectional observational study. The community survey interviewed males and females in the BRAM and Wellington area in 2008. Of these, 99 randomly selected participants in each area formed part of the nested study.

For the nested study, mothers were randomly selected and interviewed, as part of the maternal questionnaire in the Wellington and BRAM area. Over 400 mothers were interviewed for the main study in Wellington in 2008 and about 800+ in the BRAM area in 2009.

Mothers of FAS and PFAS children (100) and 400 controls were interviewed for the nested study in 2008 (Wellington site) and 2009 (BRAM site). Women who entered case management were interviewed in Wellington in 2008 and 2009 for the main study and the nested study. In total, 73 women formed part of this component. Of these, 50 women formed part of the nested study due to time constraints. These women were recruited through the in-school screening and antenatal screening components of the study as well as through referral.



### **5.3. Procedures**

The Wellington research team consisted of two registered social workers, three registered nurses, a research psychologist and two field workers. The BRAM team consisted of two registered social workers, a registered nurse and a registered clinical psychologist (researcher for the nested study and Project Coordinator for the main study in the BRAM-area for 8 months (control site).

#### **1) Community Surveys**

The community survey was conducted in the Wellington and BRAM area in 2008 and 2009. A cluster random sampling approach was used to select the participants. The target population was persons aged 18 to 64 in the 2001 census. Maps were provided by the municipality. Blocks were drawn on the wards (4x4cm) and each was numbered. Plots were also numbered and blocks were drawn. A random number generator was used to select the participants by selecting a block. A person residing in the block was then again randomly selected if there were more than one person in the target population residing in the particular block. Two persons were interviewed on every farm that was randomly selected. The same number of participants (99 in each area) were randomly selected from each area (BRAM and Wellington) and asked to participate in a survey enquiring about their demographics, substance usage, trauma, domestic violence, stressors, lifestyle, etc. Interviews were conducted in the participants' houses or outside to ensure privacy. The participants' decided if they wanted to conduct the questionnaire in Afrikaans or English. The questionnaire took about an hour to complete. Participants received a R50 gift voucher after completion of the questionnaire. Some 99 participants from the

Wellington area and 99 participants from the BRAM area formed part of the nested study. The community survey comprised 250 questions. It contained demographic questions, health status and risky behaviour questions, questions on drinking and consequential behaviour, questions about drugs and tobacco, questions to assess the knowledge, values, attitudes and beliefs about drinking and the possible effects of drinking. The following questionnaires also formed part of the community survey: Life Events Checklist, AUDIT and CAGE. A community survey questionnaire is attached (Addendum 1).

### **3) Maternal Questionnaire**

Prior to the maternal questionnaires the In-school screening phase took place that will be briefly discussed. The In-school screening was important because it was used to identify the study participants (cases and controls) for the maternal questionnaire. The cases and controls were identified based on the diagnosis of the Grade 1 learners. The FAS screening in schools used active case ascertainment techniques (May & Gossage, 2002); this took place in four cohorts - 2 in the prevention site and 2 in comparative sites. The same diagnostic criteria and protocols were applied to both the prevention and control communities. All referred children were firstly assessed by a dysmorphologist (specialist in child development) blinded to the history of the child. Staff carrying out developmental testing was also blinded to medical history. Assessment was supplemented by a medical history summary. Measurement of response data among mothers was retrospective, except for women in case management who were followed up weekly. Drinking, quantity of drinking, frequency of drinking and the timing of the drinking

during the gestation of each index child was captured. The final diagnosis of FAS and PFAS was only made by the diagnostic team during a case conference, whereby standardised data from each substantive domain and standardised forms were used. The first 100 mothers in the study areas (50 in BRAM and 50 in Wellington) that had a child with FAS or PFAS in the in-school screening phase and whom completed the maternal questionnaire were selected as cases for this study. The first 400 women in the study areas (200 BRAM and 200 Wellington) that completed the maternal questionnaire and that had a child without FAS or PFAS in the in-school screening phase were selected. Before the dysmorphology exams of the children, control (comparison) children were selected via a random-number table. Thirteen primary schools from the Wellington area and 45 schools from the Robertson area took part in the research. After the schools were identified the team obtained permission from the respective schools to take part in the study. Participant information and consent forms were handed out to grade one learners and consent was obtained from their parents. An example of the consent form is attached (Addendum 2). The forms were collected and the participants' height, weight and head circumference measured. Those who fell under the 25<sup>th</sup> percentile together with a group of 'control' children were examined by a team of dysmorphologists. This nested study used information gathered from the maternal risk questionnaire completed by mothers of children assessed for FAS and FASD. The study involved interviews and questionnaires to assess the relationships between trauma, PTSD and alcohol use disorders in this community. The questionnaires were conducted in Afrikaans or English via interviews depending on the participants' language of preference. Alcohol usage questions addressed standard quantity (Q) and frequency (F) measures over the past week, 30 days, and year. A weekly drinking log

was used (time line follow-back method) at the beginning of the Q-F measures to assure accurate recall. In addition, pictures of a variety of drink containers for alcoholic beverages were provided to respondents to accurately gauge amounts of alcohol consumed. Additional questions addressed mental health status, social support, prevention participation, birth control, nutrition, drinking ecology, and self-efficacy.

The questionnaire was developed at the University of New- Mexico (UNM) and in South Africa from existing tools, including existing tools from the UNM and SA, namely the Wilsnack's drinking surveys (Wilsnack, et al., 1991), previous FAS projects, the NIDA/SAMSHA Household Survey, and the abbreviated Form-90 mental health scale. Mothers were selected via their children. Mothers of these children were subsequently asked to complete a maternal risk questionnaire. The questionnaire took about two hours to administer. Some 400 controls (mothers who do not have a child with FASD) formed part of the nested study, as well as 100 mothers from the two areas with a child diagnosed with FAS. The diagnosis was confirmed at the case conferences that took place at regular intervals after the in-school screening phase. Neither the mother nor the interviewer knew the diagnosis of the child at the time of the maternal questionnaires. The maternal questionnaires took place in the field and were mostly done in the women's house or sometimes in a private room at a school or a church. Mothers were taken to the study site when no other place for an interview was available. When the mothers were deceased or a foster parent completed the questionnaire, the participant was excluded from the nested study. The following questionnaires formed part of the maternal questionnaires: MINI, DTS, CTQ, SSCL-51,

Partner Violence questionnaire, AUDIT and CAGE. A maternal questionnaire is attached (Addendum 3).

#### **4) Case Management**

Women who have already given birth to a child diagnosed with FASD and heavy drinking women (8 or more drinks per week, or one binge which is 3 or more drinks per day) of child bearing age who have high scores on the self-administered questionnaire, was contacted through various ways: agency referral or self-referral; antenatal clinic attendance and screening; vigilance and screening in the maternity settings; and by outreach and education in high risk settings (e.g. the wine farms where many of the FAS children come from, the informal settlements of Wellington, near bars and packing stores in downtown Wellington, and shebeens). The maternal questionnaires were also used to identify high risk women. The case management only took place in the Wellington area, as this was the intervention site. These high risk women were offered FASD prevention services throughout case management. Questionnaires and interviews were used to assess the relationship of trauma and PTSD to drinking outcomes in a sub-sample of women who entered into case management. The interviews were conducted in Afrikaans or English depending on the participants' language of choice. Transport was arranged when necessary. Women were interviewed at the study site by researchers that were trained in motivational interviewing and the community reinforcement approach. These techniques were used to encourage behaviour change in drinking habits and to promote positive change. After each follow-up (6 months, 12 months and 18 months) the severity of the drinking was measured to ascertain if the intervention is successful.

Other psychopathology were also diagnosed and assessed. Women were motivated to decrease high risk behaviour. The participants were also referred to clinics and other agents when necessary. The 50 women formed part of the nested study's case management component and were assessed at intake and followed up on at 6 months, 12 months and 18 months. The following questionnaires formed part of the case management: MINI (intake), Davidson Trauma Scale (intake), SSCL-51 (intake, 6 months, 12 months and 18 month follow-up), Partner Violence questionnaire (intake, 6 months, 12 months and 18 months follow-up), AUDIT (intake, 6 months, 12 months and 18 months follow-up, CAGE (intake). A case management questionnaire is attached (Addendum 4).

#### **5.4. Instruments**

All the questionnaires were available in Afrikaans or English and were done in the participant's language of choice. The maternal questionnaire, community survey questionnaire and case management questionnaire was originally in English and was translated into Afrikaans for the purpose of both the main study and the nested study. The translation from English into Afrikaans was done by an experienced person that has been translating questionnaires for FAS studies since 2002. Direct translation was done and the meaning of the words was not lost. It was beneficial for the participants to complete the questionnaire in the language of their choice. Most of the participants in the study areas were Afrikaans.

The main study's maternal questionnaire comprised detailed assessment of alcohol and drug usage, pregnancy, sexual risk behaviours (including questions about HIV/AIDS), nutritional status, losses, and psychological pain and current stressors among others (see Addendum: Tables 18 & 19). The community survey also included detailed questions about alcohol and other substance usage, stressors, psychological pain and behaviour caused by alcohol abuse. The following measures were included in the main study's questionnaires to screen and assess for PTSD, depression, alcohol abuse, traumatic event exposure, past childhood abuse/neglect, partner violence and stressful life events.

#### 5.4.1 Demographic Questionnaire

Questions enquiring about residence, age, total monthly income, education, children, occupation, marital status and gender were included, where applicable, in the Community Survey, Maternal Questionnaire and Case Management Questionnaire.

#### 5.4.2 MINI International Neuro-psychiatric Interview

The PTSD and depression modules of the MINI International Neuro-psychiatric Interview (MINI) were added to the original maternal questionnaire for the purpose of this study. The MINI was originally developed to provide a short, diagnostic, structured interview, compatible with DSM (APA, 1994) and ICD-10 (International Classification of Diseases) criteria. The questions are specific and the responses are limited. Symptoms that are clinically significant are distinguished from symptoms that are due to everyday life difficulties. The MINI focuses on current diagnoses and only focuses on lifetime diagnoses

where it is relevant to the current (e.g. when diagnosing bipolar mood disorder and enquiring about previous manic episodes). The instrument explores 17 axis I diagnoses, giving priority to the identification of current disorders. One or two screening questions are used to rule out the diagnosis when answered negatively for most of the diagnostic sections. Other diagnostic criteria are explored when a positive response is given to a screening question by using decision tree logic. One of the limitations of the MINI is that no lifetime diagnosis is available for most of the major disorders. The MINI was added to the maternal questionnaire and case management (intake) for the purpose of this study.

#### 5.4.3 The Life Event Checklist (LEC)

The Life Event Checklist from the Clinician Administered PTSD Scale is a 17-item self-report questionnaire enquiring about 29 types of potential trauma, that would qualify as traumatic or life threatening as defined by the DSM-IV, as well as a measure to examine vicarious trauma (heard about life-threatening event). It consists of 17 questions where an individual has to code a (was exposed directly to event), b (witness to event), c (fear of event happening to self or significant other), d (unsure) or e (not applicable). The questions enquire about natural disaster, fire, transportation accidents, serious accidents, exposure to toxic substance, physical assault, sexual assault, other unwanted sexual experience, captivity, combat, life-threatening illness, human suffering, sudden violent death, other death, causing harm to someone else and other very stressful events. In a study by Gray et al. (2004) the LEC revealed satisfactory temporal stability and good convergence with an established measure of

trauma history, namely the Traumatic Life Events Questionnaire. In the clinical sample of combat veterans the LEC was strongly associated with PTSD symptoms and significantly correlated with measures of psychological distress in the predicted directions. The questionnaire was added to the main study's community survey for the purpose of this study.

#### 5.4.4 The Davidson Trauma Scale (DTS)

The Davidson Trauma Scale (Davidson, 1996) is a self-rating scale for assessing the severity and frequency of PTSD symptoms and for assessing treatment outcome. Scale items measure the 17 core symptoms of PTSD as found in DSM-IV. The DTS is quick to administer (taking less than 10 minutes) and has been tested in a variety of populations, including men and women who have experienced different kinds of traumatic events. Responses are recorded using three clusters of sub-scores that are computed from 5-point rating scales. A total score is generated from the totals of the three sub-scales. The items can be grouped into intrusion, avoidance and numbing, and hyper- arousal symptom clusters. Each DTS item is measured on a scale of 0-4, for both severity and frequency, such that the maximum possible score is 136. Reliability and validity have been established. The following questions form part of the scale:

- Have you ever had painful images, memories, or thoughts of the event?
- Have you ever had distressing dreams of the event?
- Have you felt as though the event was recurring or what is as if you were reliving it?

- Have you been upset by something which reminded you of the event?
- Have you been physically upset by reminders of the event?
- Have you been avoiding any thoughts or feelings about the event?
- Have you been avoiding doing things or going into situations which remind you of the event?
- Have you found yourself unable to recall important parts of the event?
- Have you had difficulty enjoying things?
- Have you felt distant or cut-off from other people?
- Have you been unable to have sad or loving feelings?
- Have you found it hard to imagine having a long life span fulfilling your goals?
- Have you had trouble falling asleep or staying asleep?
- Have you been irritable or had outbursts of anger?
- Have you had difficulty concentrating?
- Have you felt on edge, been easily distracted, or had to stay “on guard”?
- Have you been jumpy or easily startled?

Test-retest reliability is  $r = 0.86$ , and split-half reliability is  $r = 0.95$ . Validity was determined comparing the DTS to the conceptually related Symptom Checklist 90-R as well as comparing it to conceptually different measures. A total score of 40 on the DTS indicates clinically significant PTSD. The scale forms part of the maternal study and case management (intake).

#### 5.4.5. The Childhood Trauma Questionnaire-Short Form (CTQ-SF)

The Childhood Trauma Questionnaire (Bernstein et al., 1994) is a 28-item self-report inventory that measures the construct of victimisation and provides brief, reliable, and valid screening for histories of abuse and neglect. It was designed for a population of age 12 and older. The CTQ has been used in clinical and community adolescent and adult populations. It enquires about five types of childhood maltreatment: emotional abuse (EA), physical abuse (PA), sexual abuse (SA), emotional neglect (EN) and physical neglect (PN). Each scale consists of 5 items as well as an additional minimisation/denial scale (MD) that consists of 3 items and indicates potential underreporting of maltreatment. Items are on a 5 point scale according to their frequency (1= never true, 2=rarely true, 3=sometimes true, 4=often true, 5= very often true). Subscale scores ranges from 5 (no history of abuse or neglect) to 25 (very extreme history of abuse and neglect). It takes about 5 minutes to administer the questionnaire. The reliability of 5 CTQ subscales range from 0.66 to 0.92 in psychiatric outpatients, and content, concurrent, and construct validities have been established. Good internal consistency for each of the abuse scales of the CTQ-SF across four heterogeneous samples were reported by Bernstein et al., (1994). In a sample of drug-abusing inpatients and a sample of community-based drug abusers the following internal consistency were reported by Thombs et al., (2007): physical abuse=0.83 to 0.86; emotional abuse=0.84 to 0.89; sexual abuse=0.92 to 0.95; physical neglect=0.61 to 0.78; emotional neglect=0.85 to 0.91. The CTQ have been used in various South-African studies. A study by Lochner et al., (2010) found psychometric adequacy for 4 of the 5 subscales as well as for the MD subscale. The internal

consistency of the physical neglect subscale was relative low (0.41). These questions form part of the main studies maternal component and was also used for this nested study.

#### 5.4.6. Partner Violence Questionnaire

A questionnaire comprising of 18 questions on intimate partner violence was included in the maternal risk questionnaire. The questionnaire derives from the questionnaire used in the WHO multi-country study on women's health and domestic violence (Garcia-Moreno et al., 2006). Respondents are asked questions about their experience of specific acts of physical and sexual violence by a current or former intimate male partner in the past 6 months and prior to the past 6 months. Respondents are required to answer yes or no to these questions, as well as indicate how often these acts of intimate partner violence have occurred. Examples of questions include: 'Has your husband or any other partner ever insulted you?', 'Has your husband or any other partner prohibited you from leaving your home?', 'Has your husband or any other partner screamed at you?', 'Has your husband or any other partner threatened to hurt you?' etc. The questionnaire was only administered to female community members and not male community members. These questions are included in the community survey, maternal study and case management (intake, 6, 12 and 18 months follow-up).

#### 5.4.7. Self-Report Symptom Checklist (SSCL-51)

The SSCL-51 is a self-report instrument that was developed by Uhlenhuth et al. (1983) to measure some of the most common psychological symptoms found in clinical populations, and provide a

descriptive measure of how distressed a person is and in what ways. While it is not a diagnostic tool, it still is a useful descriptive tool. The following classes of symptoms are included in the SSCL-51:

1) Somatic Anxiety

Physical symptoms of anxiety are reported here including heart palpitations, trembling, sweating, dizziness or stomach complaints.

2) Decreased Energy/Interest

Common symptoms of depression are included like loss of interest, fatigue, increased sleeping, decrease in pleasure and enjoyment.

3) Depressed Mood

This scale refers to the cognitive and emotional aspects of depressions for example feeling down, hopelessness, loneliness and feeling unworthy.

4) Hostility

Angry feelings, temper outbursts, irritability, argumentative and wanting to break things or hurt people.

5) Anxious Mood

These symptoms include feeling worried, tense, nervous, restless, fearful and too excited.

6) Panic/Phobia

Panic symptoms and phobia symptoms that are common are reported here, like being afraid without any fearful situation being present, avoidance of certain situations, agoraphobia and social phobia.

7) Impaired Cognition

This scale includes symptoms such as memory impairment, poor concentration and being indecisive.

Compulsive symptoms like checking, counting or compulsive cleaning is also noted here.

#### 8) Sleep Disturbance

The two items that are reported here is finding it difficult to initiate sleep and finding it difficult to stay asleep.

#### 9) Appetite Disturbance

Decreased appetite and eating too much with consequential weight gain is reported here.

Scale scores are best interpreted relative to each other and to the total score for the individual client. It is possible to discriminate among psychological symptom classes when the individual scale scores of the symptom dimensions are calculated. The symptoms are grouped into different scales to in order to have a clear understanding and description of the psychological symptoms that a person may be experiencing.

The total score gives an indication of how much total stress the person is experiencing. The client's total score also provides an anchor point for comparison.

This questionnaire was added to the maternal study and case management (intake, 6, 12 and 18 months follow-up) for the purpose of this study.

#### 5.4.8. The Alcohol Use Disorder Identification Test (AUDIT)

The Alcohol Use Disorder Identification Test (Babor et al, 2001) is a ten-item questionnaire that specifically refers to alcohol. The core instrument asks three questions on the amount and frequency of drinking, three questions on alcohol dependence and four on problems caused by alcohol. Adverse psychological reactions are included. The score for each question ranges from 0-4 with 0 being the lowest and 4 the highest possible score for each item. The total score of the individual is calculated by adding the scores of all ten questions. Low risk drinking will be a score of 7 or less. High risk drinking is indicated by a score of 8-40. High intra-scale reliability has been found and the correlation with alcohol consumption is good. The questions are representative and able to distinguish light drinkers from heavy drinkers. The responses on the AUDIT items were also found to be accurate irrespective of age, gender or cultural background.

The following are advantages of the AUDIT:

- Cross-national standardisation. The AUDIT is the only screening test that is specifically designed for international use.
- It identifies hazardous and harmful alcohol use
- The test is brief, flexible and rapid
- The screening instrument is designed for use by primary health care workers
- A non-alcohol-specific clinical instrument is also included

- The AUDIT is consistent with the terms alcohol dependence and harmful alcohol use as defined by ICD-10 definitions.
- The test focuses on recent alcohol use.

When the AUDIT is administered in the correct manner, few participants are offended by the questions. This questionnaire was part of the main study's questionnaire and formed part of the community survey, maternal study and case management (intake, 6, 12 and 18 months follow-up).

#### 5.4.9 Cut, Annoyed, Guilty, Eye-opener Questionnaire (CAGE)

The CAGE is an acronym of its four questions. It was developed by John Ewing (1984) and is widely used to screen for alcoholism in adolescents 16 and older as well as adults. It is self-reported or can be administered by a clinician. It takes less than a minute to complete. The questionnaire asks the following questions:

- 1) Have you ever felt you needed to cut down on your drinking?
- 2) Have people annoyed you by criticising your drinking?
- 3) Have you ever felt guilty about drinking?
- 4) Have you ever felt you needed a drink first thing in the morning (eye-opener) to steady your nerves or to get rid of a hangover?

Question 4 on its own can be seen as an indication that the respondent has an alcohol problem due to the fact that an eye-opener denotes abuse, since the respondent is going through withdrawal symptoms. A score of 2 or more is indicative of possible dependence. The CAGE questionnaire has been validated for use in identifying alcoholism. The questionnaire forms part of the community survey, maternal study and case management (intake).

### **5.5 Ethical Considerations**

The main study was approved by the Committee for Human Research at the University of Stellenbosch (Ethics approval number 6/07/129 dated 02 March 2006). A copy of the ethical approval is attached (Addendum 5). The nested study was submitted to the Committee for Human Research for approval as an amendment to research project 6/07/129.

Informed voluntary consent was obtained from all participants for study participation. Protection from harm and discomfort were ensured. The participants were informed about the objectives and purposes of the study. All information obtained from participants in the study was kept confidential. Procedures to maintain patient confidentiality was maintained through the coding of patient information. All patient-identifying details such as name and hospital number was linked to a study number and kept in a separate file that was not directly attached to the dataset (paper or electronic) at any stage. Only the project team had access to the information. Cognisance was taken of organisations and stakeholders involved in this study, for example the hospital management. Permission for the study was obtained by

the Department of Health. Questionnaire administration was conducted by a trained researcher with experience in interviewing as well as in the identification and management of distressed participants. Participants who were assessed as emotionally distressed, or in need of psychiatric evaluation were referred to the closest community psychiatric clinic for further management. The researcher was guided by three fundamental ethical principles stated by Brink (2006) namely:

- 1) respect for people,
- 2) beneficence and justice,
- 3) human rights protection namely:
  - the right to self-determination
  - the right to privacy
  - the right to anonymity and confidentiality
  - the right to fair treatment
  - protection from discomfort and harm

## **5.6 Statistical Analysis**

All statistical procedures were performed using the Statistical Package for the Social Sciences (SPSS) for Windows (version 18). Frequencies (f), percentages (%), mean (M), standard deviations (SD), and ranges were calculated for all independent variables.

This nested study used the same sampling frame as the main study. Dr. Jan Gossage, statistician at the University of New-Mexico provided input on the data analysis. The main study's major analyses compared changes in FAS prevalence with and without exposure within the FAS prevention model.

#### 5.6.1 Community Survey

In the first component, namely the community survey, males and females were compared in the two study communities on various demographic and clinical variables. Descriptive statistical analyses were performed using SPSS. Chi-square tests of association and t-tests for independent samples were undertaken for the bivariate analyses within a study area. Binomial logistic regression was used to compare the prevention community (BRAM) with the intervention community (Wellington). Alpha was set at 0.05 for all analyses.

#### 5.6.2 Maternal Questionnaires

In the second component, namely the maternal study, women with and without alcohol use disorders as well as women with or without a child with FAS were compared in the two study communities on several demographic and clinical variables. Descriptive statistics were performed using SPSS. Alpha was set at 0.05 for all analyses. Bivariate analyses were used to compare differences in the rate of PTSD (on the MINI) in women with and without alcohol dependence, using chi-square tests, and between-group differences in scores on the AUDIT and DTS, using Mann-Whitney U Tests to test the hypothesis

that rates of PTSD, and PTSD symptom scores, will be higher in women with alcohol abuse/dependence compared to those without. Women with and without alcohol dependence/ alcohol abuse and PTSD were compared with respect to a diagnosis of MDD current, MDD recurrent and MDD with melancholic features using chi-square tests. Pearson's correlation coefficients were computed among the AUDIT score, the DTS (total score) and the SSCL 51 (total score) to determine whether the presence and severity of an alcohol use disorder will be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity. To test the hypothesis that women with alcohol use disorders and PTSD will have higher rates of intimate partner violence, childhood trauma and everyday stressful life events compared to those without PTSD the following was conducted: Chi-square tests were performed to determine the difference between women with alcohol abuse/dependence and PTSD compared to women with alcohol abuse/dependence without PTSD on intimate partner violence questions and current stressor questions. An independent samples t-test was conducted to assess the difference between the mean of the CTQ (total) for women with alcohol abuse/dependence and PTSD and women with alcohol abuse/dependence without PTSD. An independent samples t-test was computed to assess the difference between the mean ages that women with alcohol abuse/dependence and PTSD regularly started drinking alcohol compared to women with alcohol abuse/dependence without PTSD to assess whether an alcohol use disorder is secondary to the development of PTSD.

### 5.6.3 Case management

In the third component, descriptive statistical analyses were performed using SPSS. Analyses of variance for continuous variables were used. Eta squared ( $[\eta]^2$ ) was used as a measure of effect size for these analyses, Chi square analysis was used for dichotomous variables and Fisher exact tests for expected cell sizes  $\leq 5$ . Two-tailed bivariate and partial Pearson correlation coefficients were calculated as appropriate. A matched case-control sequential logistic regression analysis was used to predict the presence vs. absence of PTSD as a function of selected survey items related to demographic, clinical, behavioural, social and nutritional factors in all women included in this nested study. Alpha was set at 0.05 for all analyses. Women, who entered into case management for the purposes of this study, were defined as (a) alcohol treatment responders, (b) PTSD treatment responders, and (c) alcohol and/or PTSD non-responders. Alcohol treatment responders were women who demonstrated a 75% or greater decrease in both frequency (percent days drinking) and intensity (average number of drinks per day) of drinking, when comparing pre- and post-treatment. PTSD treatment responders were women who demonstrated a 30% or greater decrease in the DTS total score from baseline to the end of treatment. Non-responders were women who did not have either a PTSD or an alcohol treatment response during case management.

Bivariate analyses were used to compare alcohol dependence and alcohol abuse on the MINI with PTSD (MINI), SSCL51 (total) and DTS (total) on the MINI using Mann-Whitney U Test and Chi-square. This was used to test the hypothesis that rates of PTSD will be higher in women with alcohol abuse or dependence compared to those without. The AUDIT (total score) and the CAGE (total score) was

compared with the DTS (total score) using Mann-Whitney U Test. Alcohol dependence and alcohol abuse was compared with MDD current, MDD recurrent and MDD with melancholic features using Chi-square. This was used to test the hypothesis that the severity and course of alcohol abuse/dependence will be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity (e.g. depression). ANOVA was used to compare alcohol dependence, alcohol abuse and PTSD (MINI) with SSCL 51 (total), DTS (total) and partner violence questions in women with PTSD and women without PTSD. This was applicable to the following hypothesis: Women with alcohol abuse/dependence and PTSD are more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD. RMANOVA was used to determine the difference in drinking outcomes and PTSD from intake to 18 months follow-up to test the hypothesis that women with alcohol use disorders and PTSD who enter into case management will have worse drinking outcomes than those without PTSD. The power analysis was set at .635 to ensure that the results had sufficient statistical power to make inferences.

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## CHAPTER 6

### RESULTS

The broad objective of this study was to investigate the prevalence of trauma, post-traumatic stress disorder (PTSD) and other psychopathologies in women with an alcohol use disorder (alcohol abuse or dependence (AUDs)). The principal aim of the study was to establish the relationship between the traumatic exposure, onset of PTSD, and the severity and course of AUDs and other psychopathologies (e.g. depression, other anxiety symptoms, other substance misuse).

Hypotheses that this study set out to test are:

- Hypothesis 1: Rates of PTSD will be higher in women with alcohol abuse or dependence compared to those without;
- Hypothesis 2: The severity and course of alcohol abuse/dependence will be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity (e.g. depression);
- Hypothesis 3: In women with lifetime PTSD, the development of an alcohol use disorder is more likely to be secondary to the onset of PTSD;
- Hypothesis 4: Women with alcohol abuse/dependence and PTSD are more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD;

- Hypothesis 5: Women with alcohol use disorders and PTSD who enter into case management will have worse drinking outcomes than those without PTSD.

For the maternal studies (maternal questionnaire), women were defined as AUD women based on their score on the MINI Alcohol Abuse and Dependence scale as well as the AUDIT and the CAGE. The difference between women who have a child with FAS and those who do not have a child with FAS were also noted, as the FAS women (child with FAS) had significantly higher scores on the AUDIT and the CAGE – with the average score of the AUDIT and CAGE indicating alcohol dependence and high risk drinking. The rate of alcohol dependence (current) was much higher in the FAS group, with the average total for the AUDIT and CAGE indicating high risk drinking and alcohol dependence with a statistically significant difference. The mean for the AUDIT score in the FAS group was 8.49 and the mean in the No FAS group was 3.31 with  $p=0.00$ . The mean for the CAGE was 3.40 in the FAS group and 1.45 in the No FAS group with  $p=0.00$ . The score totals for the AUDIT and CAGE are summarised in Table 10.

In case management, women were defined as PTSD or no PTSD, based on their DTS score and the MINI PTSD scale.

The results will be discussed according to the study questions. Demographic characteristics and drinking habits in the community will also be included, in order to provide a better understanding of the specific community concerned.

## **6.1. Demographic characteristics (Community Survey, Maternal Study & Case Management)**

### 6.1.1 Community Survey

The community survey data consisted of 99 participants resident in each of the Wellington and BRAM communities. The average age of the male participants in the Wellington community was 39 years ( $M=38.87$ ,  $SD=13.53$ ) and that of the female participants was 38 years ( $M=38.14$ ,  $SD=12.76$ ). The average age of the male participants in the BRAM community was 39 years ( $M=39.40$ ,  $SD=13.70$ ) and of the female participants 38 years ( $M=37.65$ ,  $SD=11.37$ ). Regarding gender, 79 of the participants were male and 119 were female. The demographic characteristics of the community survey are summarised in Table 1.

### 6.1.2 Maternal Study

In the maternal study the average age for the 100 women who have a child diagnosed with FAS was 36 years ( $M=35.90$ ,  $SD=6.41$ ). The average age for the 400 women without a child diagnosed with FAS (the controls) was 34 years ( $M=33.90$ ,  $SD=7.00$ ). Other demographic characteristics are presented in Table 2. Maternal risk factors are summarised in Table 3.

### 6.1.3 Case Management

The average age for the 50 women was 24 (M=24.20, SD=6.07). The gravidity average (number of pregnancies and births) for the 50 women in case management was 3 (M=2.62, SD=1.38). Almost half of the women (48.0%) resided in an urban (conventional) location and 44.0% in a rural area. Only 8.0% of the women lived in a squatter camp. The average number of years of schooling that the women attended was 8 years (M=8.29, SD=2.49). The average total monthly income from all sources was R2370.43 (SD=1607.71). More than half (74.0%) of the women were pregnant at the time of the interview. The average full parity (number of pregnancies and births that were full term) was 2 (M=1.82, SD=1.01). The average number of pregnancies and births that were pre-term (<36) was 1 (M=0.57, SD=0.64). Only 15 women completed the miscarriage question with a mean of 0.80 miscarriages reported (SD=1.01). The still birth question was only completed by 11 women, with a mean of 0.27 still births (SD=0.46).

Demographic characteristics for case management is summarised in Table 4.

**Table 1 Community Survey: Demographic Characteristics**

Variable	WELLINGTON					BRAM				
	Male (n=32)		Female (n=67)			Male (n=47)		Female (n=52)		
	N	%	N	%	p	N	%	N	%	p
Demographics										
Occupation	0.000*									
Factory	0	(0.0)	5	(7.6)		2	(4.4)	7	(13.5)	0.000*
Farm Worker	12	(37.5)	10	(15.2)		29	(64.4)	10	(19.2)	
Office	1	(3.1)	4	(6.1)		1	(2.2)	0	(0.0)	
Housewife	0	(0.0)	20	(30.3)		0	(0.0)	13	(25.0)	
Domestic	0	(0.0)	2	(3.0)		0	(0.0)	4	(7.7)	
Other	14	(43.8)	11	(6.7)		9	(20.0)	13	(25.0)	
Don't work	0	(0.0)	2	(3.0)		1	(2.2)	2	(3.9)	
Residential	0.364									
Rural	14	(43.8)	23	(34.3)		30	(66.7)	14	(26.9)	0.000*
Urban	18	(65.3)	44	(65.6)		15	(33.3)	38	(73.1)	
Religious	27	(84.4)	61	(91.0)	0.365	34	(75.6)	48	(92.3)	0.002*

\*Statistically significant p values.

**Table 2 Maternal Study: Demographic Characteristics**

Variable	FAS (n=100)				NO FAS (n=400)				p	Z
	N	%	Mean	SD	N	%	Mean	SD		
Current Age			35.94	6.42			33.96	7.00	0.010*	
Occupation group									0.129	
Factory Worker	5	(5.0)			67	(16.8)				
Farm Worker	56	(56.0)			98	(24.5)				
Office Worker	0	(0.0)			13	(3.3)				
Housewife	14	(14.0)			63	(15.8)				
Housekeeper	12	(12.0)			46	(11.5)				
Does not work	4	(4.0)			13	(3.3)				
Total monthly income			1848.67	1777.77			3564.51	7.00	0.021*	
Living children			2.68	1.30			2.52	1.06	0.406	0.83
Deceased children			1.91	0.51			1.97	0.16	0.276	-1.08
Marital status with child									0.285	
Married	11	(11.0)			113	(28.3)				
Widowed	4	(4.0)			25	(6.3)				
Divorced	3	(3.0)			20	(5.0)				
Separated	9	(9.0)			8	(2.0)				
Single	8	(8.0)			20	(5.0)				
Cohabiting	45	(45.0)			87	(21.8)				
Live with parents	12	(12.0)			112	(28.0)				

\*Statistically significant p values

**Table 3 Maternal Study: Maternal Risk Factors**

Variable	FAS (n=100)				NO FAS (n=400)				p	Z
	N	%	Mean	SD	N	%	Mean	SD		
Farm Worker	56	(56.0)			98	(24.5)				
Income			1848.67	18.77			3564.51	7.00		
Religious	9	(9.0)			149	(37.3)			0.016*	-2.40
Gravidity			3.53	1.47			2.88	1.32	0.000*	4.19
Parity			2.77	1.60			2.59	1.21	0.252	1.14
Parity Preterm	22	(22.0)			48	(10.2)			0.000*	3.60
Parity Full	74	(74.0)			839	(80.8)			0.044*	2.00
Miscarriages			0.71	1.04			0.35	0.62	0.028*	2.19
SIDS			2.18	1.12			2.02	0.44	0.675	0.42
Stillborn			1.47	1.69			0.71	1.24	0.001*	3.14
Cohabiting	45	(45.0)			87	(21.8)			0.001*	3.23
Age pregnant			27.38	7.70			26.63	7.10		
Planned	29	(29.0)			172	(43.0)				
Child-foster care	11	(11.0)		10	(2.5)				0.156	1.41
Multiple fathers	11	(11.0)		29	(7.3)				0.008*	2.64

\*Statistically significant p values

SIDS = Sudden Infant Death Syndrome

**Table 4 Case Management: Demographic Characteristics**

Variable	N=50				
	N	%	Mean	SD	Range
Current Age			24.20	6.07	15-39
Ethnic Group					
Black	1	(2.0)			
Coloured	29	(58.0)			
Missing	20	(40.0)			
Years Schooling			8.29	2.49	1-12
Occupation Group					
Owner, Major Prof.	1	(2.0)			
Nurses & teachers	11	(22.0)			
Clerical & sales	0	(0.0)			
Skilled manual	5	(10.0)			
Semi-skilled	0	(0.0)			
Unskilled	5	(10.0)			
Homemaker or disabled	7	(14.0)			
Total monthly income			2370.44	1607.71	0-8690
Number of Children (1-2)	25	(50.0)			

## **6.2. Drinking characteristics in the communities**

### **6.2.1. Community Survey**

For the community survey, participants were defined as alcohol dependent using the CAGE and AUDIT score. According to the CAGE, 8 males (25.0%) and 16 females (23.9%) in the Wellington region had a score that confirmed alcoholism, whereas 3 males (9.3%) and 5 females (7.4%) had a strong indication of alcoholism. In the BRAM region, 17 males (37.7%) and 7 females (13.4%) had a score that confirmed alcoholism and 8 males (17.8%) and 3 females (5.8%) had a strong indication of alcoholism. More males than females in the BRAM region confirmed that they had a problem with alcohol somewhere in their lives, with 20 males (44.4%) and 2 females (3.9%) admitting to it. In the Wellington region 13 males (40.4%) and 13 females (19.4%) confirmed that they had a drinking problem previously or currently. No females reportedly had any binge episodes in the BRAM region a week prior to their interview, whilst 8 males (22.9%) reported that they had 3 or more binge episodes in the past week. In the Wellington region only 1 male (3.1%) and 1 female (3.1%) reported that they had 3 or more binge episodes during the week prior to the interview. Males drank more than females in the 30 days prior to the interview, with the average number of drinks for the males being 45.51 (SD=69.57) and for the females 14.51 (SD=33.37). The age that most of the respondents started using tobacco on a regular basis was 19 years (SD=4.76). The mean age that they first started using illegal substances on a regular basis was 20 years (SD=5.97).

A significant relationship was found between the total for the AUDIT and the total for the CAGE using Pearson's correlation ( $r=0.46$ ,  $p=0.00$ ). Behaviour caused by alcohol in the community survey is summarised in Table 5.

### 6.2.2. Maternal Study

The maternal studies indicated that the mean age for women from the FAS group for the first drink of alcohol was 18.29 (SD=3.48). The mean age that these women regularly started drinking alcohol was 18.86 (SD=3.80). In the No FAS group the mean age for the first drinking of alcohol was 18.35 years (SD=3.59) and the age that they regularly started drinking alcohol was 18.77 years (SD=4.65). In the FAS group 74 women (74.0%) drank 3 or more drinks per occasion during the 3 months before falling pregnant, compared to 79 (19.8%) in the No FAS group – with a statistically significant difference ( $p=0.00$ ). More women had fathers with a history of alcohol drinking problems in the FAS group (34.0%) compared to the No FAS group (19.3%), constituting a statistically significant difference with  $p=0.02$ . The FAS group had 8 women (8.0%) reporting that their fathers currently have a drinking problem and the No FAS group 23 (5.8%). In the FAS group, 7 women (7.0%) confirmed that their mothers had a problem with alcohol in the past, compared to 46 (11.5%) in the No FAS group. Some 23 women (23.0%) in the FAS group reported that their mothers currently have a drinking problem, compared to 19 (4.8%) in the No FAS group, with a statistically significant difference ( $p=0.00$ ). The average number of drinks consumed during the week (Monday-Thursday) in the FAS group was 1 (M= 0.89, SD=2.56) and 0.46 in the No FAS group (SD=4.44). The main reasons for drinking endorsed

by the FAS group were: to be sociable (46.0%) and to relax (42.0%). Other reasons cited by the FAS group were to celebrate an occasion (36.0%), to help forget worries (35.0%), to be part of a group (34.0%), and because the people whom she knew drank (28.0%). More women in the FAS group (39.0%) reported that they binged on any day during the week, compared to the No FAS group (10.0%), with a statistically significant difference ( $p=0.00$ ). In the FAS group 74 women (74.0%) admitted that they drank 3 or more drinks per occasion during the 3 months before their pregnancy, compared to 79 (19.8%) in the No FAS group, with a statistically significant difference ( $p=0.00$ ). Some 74 women (74.0%) in the FAS group reported that they drank 3 or more drinks per occasion during the first trimester of pregnancy and 70 (17.5%) in the No FAS group, with a significant difference ( $p=0.00$ ). More than half the women in the FAS group (66.0%) drank 3 or more drinks per occasion during the second trimester, compared to (9.3%) in the No FAS group, with a statistically significant difference ( $p=0.00$ ). There were more women in the FAS group (58.0%) that drank 3 or more drinks per occasion during the third trimester than the No FAS group (7.8%), with a statistically significant difference ( $p=0.00$ ).

The drinking habits of the women in the FAS group during the first 2 years of their child of interest's life varied, with 33 (33.0%) reporting that their drinking habits stayed the same, 32 (32.0%) that their drinking was less, 20 (20.0%) reported drinking more and none stopped drinking. In the No FAS group 76 women's (19.0%) drinking habits stayed the same, 42 (10.5%) drank less, 24 (6.0%) drank more, and 1 (0.3%) stopped drinking. These differences were statistically significant ( $p=0.00$ ). In the No FAS

group the main reasons for drinking were to celebrate an occasion (49.5%) and to be sociable (48.5%). To help relax (41.3%), to be part of a group (24.5%), because people the woman knew drink (20.5%) and boredom (16.3%), were the other reasons given for why the women drank. Tobacco use during pregnancy was higher in the FAS group (41.0%) compared to the No FAS group 76 (19.0%). The difference was statistically significant ( $p=0.00$ ). Two women (2.0%) in the FAS group and 5 women in the No FAS group (1.3%) admitted that they used other drugs during their pregnancy. In terms of their drinking habits during the first trimester of pregnancy with the child of interest, 42.0% of the women's drinking habits stayed the same, and 44.0 % drank more. During the second trimester, 12.0% of the women drank more than usual while the drinking habits of 28.0% stayed the same. During the third trimester 4.0 % of the women increased their alcohol intake and 10.0 % continued with their usual intake of alcohol.

### 6.2.3. Case Management

Of the 50 women, 1 (2.0%) reportedly drank during pregnancy and had a child with a diagnosis of FAS, 4 (8.0%) confirmed drinking during pregnancy and had a child with a deferred diagnosis, and 44 (88.0%) of the women were pregnant at the intake interview. At intake, 82.0% of the women were at high risk of producing an affected child in the future, 12.0% were at medium risk and for 4.0% of the women the risk was undetermined. Most of the women (80.0%) reported that they smoked or used tobacco during their recent pregnancy. In terms of other drug usage, 26.0% reported that they used other illegal substances at some stage in their life and 8.0% were currently using these substances. In case

management more than half of the women (56.0%) reported that they had a father with a past drinking problem, and 16 women (32.0%) confirmed that their fathers currently had a drinking problem. Almost half of the women (48.0%) reported that their mother had a past drinking problem and the mothers of 16 women (32.0%) currently had a drinking problem. Almost a quarter of the women (24.0%) had a best friend with a current drinking problem. With regard to the father of the child of interest's drinking habits, 40.0% of the women reported that he had a past drinking problem and 38.0% confirmed that he currently had a drinking problem. Of the 50 women, 22 (44.0%) reported that all their friends drank. The place where most of the women drank was at their friends' homes (52.0%). Other popular places to drink were their own home (44.0%) and the shebeen (22.0%). The main reason most women gave for drinking was to help them relax (54.0%), and the second most popular reason was to be part of a group (44.0%). Other reasons for drinking were to be sociable (40.0%) and to help them forget their worries (36.0%). Most of the women reported that they tried to stop drinking in the past (92.0%). The primary risk for most of the women (80.0%) was that their friends drank alcohol. Another risk was extensive family involvement in alcohol (multiple family members drink heavily) – with 70.0% of the women falling in this category. The risk of a significant other that uses alcohol, affected 66.0% of the women.

### **6.3. Stressors and challenges in the communities**

#### **6.3.1. Community Survey**

The community survey data revealed that 3.1% of male respondents and 9.8% of female respondents experienced problems caused by alcohol or substance abuse. With regard to marital or relationship problems, 9 males (4.6%) and 24 females (12.3%) confirmed this being a current stressor for them. More females (16.0%) than males (5.7%) reported that they were unemployed or experienced financial hardship. Problems with children/family affected more females (21.2%) than males (5.2%). Neighbourhood problems (neighbours, gangs) affected more males (3.1%) than females (0.5%). Stressors like gossip and a small living space influenced 7.3 % of the males and 6.7% of the females. The traumatic life event that most participants experienced in the BRAM region according to the LEC (it happened to me) was the sudden, unexpected death of someone close to them; more females (43.3%) than males (37.1%) were affected. For participants in the Wellington region, this was the second most frequent life event, with 18 males (18.2%) and 41 females (41.4%) affected. Another life event that was a frequent occurrence in both regions (it happened to me) was physical assault – where the participants have been attacked, beaten, slapped or kicked. More males (42.2%) than females (34.0%) were victims in the BRAM region, compared with 21 males (21.2%) and 39 females (39.3%) in the Wellington region. Being attacked with a weapon (shot, stabbed, threatened with a knife, bomb or firearm) was the third most frequent life event in both communities; 38 males (39.2%) and 25 females (25.8%) in the BRAM region and 22 males (22.2%) and 30 females (30.3%) in the Wellington region reported that it happened to them.

Other life events that also had a high frequency in terms of first-hand participant experience, were natural disasters; 28 males (28.9%) and 26 females (26.8%) in the BRAM region and 11 males (11.1%) and 16 females (16.2%) in the Wellington region reported on these. More males (27.8%) than females (17.5%) were involved in a life-threatening vehicle accident (taxi, train, motor car, boat, and airplane) in the BRAM region, whereas more females (29.3%) than males (13.1%) in the Wellington region had similar experiences. Fire and explosion directly affected 25 males (25.8%) and 15 females (15.5%) in the BRAM region, compared to 17 males (17.2%) and 21 females (21.2%) in the Wellington region. In the BRAM region 22.7% of males and 18.6% of females experienced a life-threatening illness or injury; in the Wellington area 13.1% of the males and 22.2% of the females reported such experiences.

Exposure to sudden or violent death (murder or suicide) happened to 17 males (17.5%) and 11 females (11.3%) in the BRAM region, and 7 males (7.1%) and 15 females (15.2%) in the Wellington region.

In the BRAM region an equal percentage of males (23.7%) and females (23.7%) reported that they were seriously beaten by a partner or spouse; in the Wellington region 16 females (16.2%) and a single male (1.0%) were seriously abused by a partner or spouse. More males (15.5%) than females (11.3%) were physically abused by parents or caregivers in the BRAM region; the Wellington region reported more females (10.1%) than males (2.0%) in this category. More males (18.6%) than females (4.1%) caused serious injury, harm or death in the BRAM community; only 1 male respondent (1.0%) did so in the Wellington region.

In terms of sexual trauma in the BRAM region, 8 males (8.3%) and 11 females (11.3%) reported that they experienced an unwelcome or uncomfortable sexual act, opposed to no males and 10 females (10.1%) in the Wellington region. Sexual assault (rape, attempted rape, forced sexual acts or threatened to do sexual acts) were endorsed by 8 males (8.3%) and 10 females (10.3%) in the BRAM region. In the Wellington region 3 males (3.0%) and 11 females (11.1%) endorsed sexual assault.

Life events that least affected the participants in the BRAM community were captivity in terms of being hijacked, kidnapped, taken hostage or as a prisoner of war (4.1 % males and 3.1% females) opposed to 4 males (4.0%) and 11 females (11.1%) in the Wellington region. The exposure to a war zone did not affect any of the communities significantly (in battle or as civilian/compulsory service), with only 3 males (3.1%) and 1 female (1.0%) reporting that they were directly affected by this in the BRAM region, and only 1 male (1.0%) and 3 females (3.0%) in the Wellington region.

Findings of total events and exposure in both communities are summarised in Table 6.

**Table 5 Community Survey: Behaviour Caused by Alcohol**

Variable	Wellington					BRAM				
	Males (n=32)		Females (n=67)		p	Males (n=47)		Females (n=52)		p
	N	%	N	%		N	%	N	%	
<i>When drinking regularly:</i>										
Socialise	19	(59.4)	47	(70.0)	0.65	34	(75.6)	30	(5.7)	0.00*
Drive under the influence	1	(3.1)	0	(0.0)	0.09	2	(4.4)	0	(0.0)	0.00*
Got arrested	1	(3.1)	0	(0.0)	0.03*	4	(8.9)	0	(0.0)	0.00*
Passed out	2	(6.3)	0	(0.0)	0.01*	6	(13.3)	0	(0.0)	0.00*
Stayed away from home	1	(3.1)	2	(3.0)	0.70	3	(6.7)	0	(0.0)	0.00*
Leave kids alone	1	(3.1)	3	(4.5)	0.86	0	(0.0)	1	(1.9)	0.56
Drink alone	6	(18.8)	1	(1.5)	0.00*	9	(20.0)	1	(1.9)	0.00*
Fight while drunk	1	(3.1)	3	(4.5)	0.24	6	(13.3)	0	(0.0)	0.00*
Attacked people in family	0	(0.0)	1	(1.5)	0.51	5	(11.1)	0	(0.0)	0.00*
Attacked outside family	1	(3.1)	3	(4.5)	0.14	5	(11.1)	0	(0.0)	0.00*
Drink in the morning	3	(9.4)	3	(4.5)	0.16	11	(24.4)	1	(1.9)	0.00*
Can't remember next day	3	(9.4)	3	(4.5)	0.00*	8	(17.7)	0	(0.0)	0.00*
Drunk for several days	1	(3.1)	1	(1.5)	0.65	5	(11.1)	0	(0.0)	0.00*
Difficult to stop drinking	4	(12.5)	4	(6.0)	0.27	14	(31.1)	1	(1.9)	0.00*
Unable to quit or cut down	2	(6.3)	3	(4.5)	0.75	11	(24.4)	4	(7.7)	0.05*
Employment problems	0	(0.0)	1	(1.5)	0.01*	4	(8.9)	1	(1.9)	0.02*
Absent from work	1	(3.1)	1	(1.5)	0.11	5	(11.1)	0	(0.0)	0.00*
Drunk at school/work	2	(6.3)	0	(0.0)	0.00*	4	(8.9)	0	(0.0)	0.00*
Partner wanted to leave	3	(9.4)	2	(3.0)	0.31	4	(8.9)	1	(1.9)	0.00*
Partner angry about drinking	5	(15.6)	3	(4.5)	0.34	13	(28.9)	1	(1.9)	0.00*
Parent wants you to cut down	4	(12.5)	11	(16.4)	0.22	10	(22.2)	2	(3.9)	0.02*
Drinking affected home	6	(18.8)	9	(13.4)	0.45	20	(44.4)	5	(9.6)	0.00*
Child afraid of your drinking	2	(6.2)	2	(3.0)	0.21	7	(17.6)	4	(7.7)	0.17
Child changes	2	(6.2)	4	(6.0)	0.17	9	(20.0)	3	(5.8)	0.07
Child's school work affected	1	(3.1)	0	(0.0)	0.15	3	(6.7)	0	(0.0)	0.14

\*Statistically significant p values

**Table 6 Community Survey: Traumatic Exposure (Life Events Checklist)**

	Valid N	Mean	Minimum	Maximum	SD	p
<b>TOTAL EVENTS</b>						
<b>BRAM</b>						
Females	52	5.30	0.00	13.00	3.39	
Males	47	7.57	2.00	15.00	3.12	0.000*
<b>WELLINGTON</b>						
Females	67	4.34	0.00	14.00	3.29	
Males	32	4.46	0.00	11.00	2.83	0.559
<b>TOTAL NUMBER OF EXPOSURES</b>						
<b>BRAM</b>						
Females	52	5.32	0.00	0.00	3.40	
Males	47	7.62	2.00	15.00	3.18	0.000*
<b>WELLINGTON</b>						
Females	67	4.82	0.00	21.00	4.38	
Males	32	4.87	0.00	12.00	3.30	0.445

Total events = traumatic events exposed to (e.g. witnessed, heard about)

Total number of exposure- direct exposure to traumatic event (e.g. it happened to me)

\*Statistically significant p value

#### **6.4. Will rates of PTSD be higher in women with alcohol abuse or dependence compared to those without them? (Maternal Study, Case Management)**

##### 6.4.1. Maternal Study

According to the MINI, more women with alcohol dependence (15.4%) and alcohol abuse (35.7%) had a diagnosis of PTSD compared to those without a diagnosis of alcohol dependence (5.3%) and alcohol abuse (5.2%), with a statistically significant difference ( $p=0.00$ ). The results from the DTS indicated that more women with a diagnosis of alcohol abuse (26.6%) had a diagnosis of PTSD compared to women without a diagnosis of alcohol abuse (6.9%) with a significant difference ( $\chi^2 = 7.42, p=0.00$ ).

According to the MINI, more women with a child diagnosed with FAS (7.0%) had a diagnosis of PTSD, compared to women without a child diagnosed with FAS (5.5%), although this was not statistically significant ( $p=0.23$ ). The mean score on the DTS was higher for the women with a FAS child (8.87) compared to the women without a FAS child (7.05), although this was not significant ( $p=0.37$ ). The PTSD totals are summarised in Table 8. The DTS total score and diagnosis of alcohol dependence current and alcohol abuse current (MINI), are illustrated in Figures 2.2 and 2.3.

##### 6.4.2. Case Management

There was not a significant difference between women with and without AUDs with regards to a diagnosis of PTSD, with  $p=0.29$ . The PTSD totals are summarised in Table 7.

## Conclusion

The findings from the maternal study support the hypothesis that women with an alcohol use disorder are more likely to have a diagnosis of PTSD.

### **6.5. Will the severity and course of alcohol abuse/dependence be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity (e.g. depression)? (Maternal Study, Case Management)**

#### 6.5.1 Maternal Study

The MINI indicated the following in terms of AUDs and the presence of PTSD and other co-morbidity: Significantly more women with a diagnosis of alcohol abuse and dependence had a diagnosis of PTSD ( $p=0.00$ ). More women in the FAS group (7.0%) had a diagnosis of PTSD, compared to the No FAS group (5.5%), although this was not statistically significant ( $p=0.42$ ). This was confirmed by the DTS which indicated that 10 women (10.5%) in the FAS group had a diagnosis of clinical PTSD, compared to 25 women (6.5%) in the no FAS group, but without a statistically significant difference ( $p=0.69$ ). A higher rate of MDD (current) was found amongst the women with a diagnosis of alcohol dependence (9.6%) compared to those without a diagnosis (8.1%), although not statistically significant ( $p=0.73$ ). More women with a diagnosis of alcohol abuse (38.5%) had a diagnosis of MDD (current) compared to those without a diagnosis of alcohol abuse (7.7%), with a statistically significant difference ( $p=0.00$ ).

The rate of MDD (recurrent) was slightly higher amongst the women with a diagnosis of alcohol dependence (6.7%) compared to those without (5.8%), but without a significant difference ( $p=0.79$ ). Women with a diagnosis of alcohol abuse had higher rates of MDD recurrent (23.0%) compared to those without a diagnosis of alcohol abuse (6.0%), with a significant difference ( $p=0.01$ ). Significantly more women with a diagnosis of alcohol abuse also had a diagnosis of MDD with melancholic features (23.0%) compared to those without a diagnosis of alcohol abuse (4.8%), with  $p=0.00$ . Some 13 women (3.3%) without a child diagnosed with FAS suffered from post-partum depression ( $SD=2.35$ ), compared to women with a FAS child (1.0%) – constituting a statistically significant difference ( $p=0.01$ ) between the groups. Both groups had the same percentage of women with a diagnosis of MDD current (7.0%). The MINI diagnoses for the maternal questionnaire have been summarised in Table 8.

The mean for total distress suffered by women in the FAS group according to the SSCL 51 was 26.04 ( $SD=22.90$ ), and the mean for the No FAS group was 16.53 ( $SD=20.04$ ). The main cause of distress in both groups was somatic anxiety and depressed mood. A significant association was found between the SSCL 51 total score and substance abuse according to the MINI ( $p=0.00$ ). There was a significant association between a diagnosis of PTSD on the MINI and the SSCL 51 total score ( $p=0.00$ ). Women with a diagnosis of PTSD had much higher scores on the SSCL 51. The SSCL 51 subscale scores and total score have been summarised in Table 10. The SSCL 51 total score and diagnosis of alcohol dependence and alcohol abuse are illustrated in Figures 2.1 and 2.5. The difference between the FAS group and No FAS group on the SSCL 51 total score, is illustrated in Figure 2.10.

With regard to the severity of AUD's, PTSD symptoms and other co-morbidity, the following was found: There was a strong, positive, significant correlation between the SSCL 51 total score and the DTS total score ( $r=.627$ ,  $p=0.001$ ). The correlation coefficients between the AUDIT and DTS total score were positive, but not significantly different from zero at the .05 level ( $r=.072$ ,  $p=.224$ ). The correlation coefficients between the AUDIT and the SSCL 51 total score were also positive, but not significantly different ( $r=.122$ ,  $p=.069$ ).

#### 6.5.2 Case Management

The case management sample had a longitudinal component and was used to assess how the course of AUD's is influenced by the presence and severity of PTSD and other co-morbidity.

Of the 50 women in case management, 12 (24.0%) reported that they suffered from depression at some stage in their lives. Almost all the women (92.0%) reported that they were currently experiencing feelings of sadness or depression. Feelings of anger were also prominent, in 46 women (92.0%). The depression diagnoses for the case management according to the MINI, is summarised in Table 7.

Psychiatric symptoms in case management were measured using the SSCL 51 as instrument. This is summarised in Table 9. The SSCL 51 gives an indication of the total distress that a person is suffering from as well as the ways in which the distress presents. The difference between the SSCL 51 total scores at different time intervals (intake, 6, 12 and 18 months follow-up,) is illustrated in Figure 2.12. The total

score was the highest at intake, lower at 6 months follow-up, and the lowest at the 12 months follow-up. The total score at the 18 month-follow up was higher than the 12 month follow-up, but still lower than the total scores at intake and the 6 month follow-up,  $F(3.90) = 2.7106$ ,  $p = 0.49$ .

The SSCL 51 total score was higher for the PTSD group at each time interval. However, the results indicated that there was not a significant association between PTSD status and total SSCL 51 scores at the different time points, as is shown by Figure 2.12,  $F(3.90) = 1.0787$ ,  $p = 0.50$ . Although there was a decrease in the AUDIT score at the 18 month follow-up in the PTSD group, it was still indicative of alcohol dependence. The AUDIT at 6 months, 12 months and 18 months follow-up for women with and without PTSD, is illustrated in Figure 2.13. The MINI diagnoses for the case management have been summarised in Table 7.

## Conclusion

The results indicated that the severity of alcohol abuse/dependence is negatively influenced by depressive symptoms and psychological distress, but not by PTSD.

**Table 7 Case Management (Intake): M.I.N.I. Diagnoses and Alcohol Dependence/Abuse**

	<i>Alcohol Dependence</i>		<i>No Alcohol Dependence</i>		<i>p</i>	<i>df</i>	<i>x<sup>2</sup></i>	<i>Alcohol Abuse</i>		<i>No Alcohol Abuse</i>		<i>p</i>	<i>df</i>	<i>x<sup>2</sup></i>
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>				<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>			
MINI Diagnoses														
MDE current	3	(9.7)	2	(6.5)	0.51	1	0.35	2	(18.2)	1	(9.09)	0.62	1	0.62
MDE recurrent	3	(16.7)	0	(0.0)	0.39	1	0.40	1	(16.7)	0	(0.0)	0.62	1	0.62
MDE melancholic recurrent	1	(4.0)	0	(0.0)	0.56	1	0.57	1	(11.1)	0	(0.0)	0.45	1	0.45
PTSD current	2	(7.4)	0	(0.0)	0.29	1	1.08	1	(10.0)	0	(0.0)	0.38	1	0.74

MINI = Mini International Neuro-Psychiatric International Interview

MDE = Major Depressive Episode

PTSD = Post Traumatic Stress Disorder

**Table 8 Maternal Questionnaire: M.I.N.I. Diagnoses and Alcohol Dependence/Abuse**

	<i>Alcohol Dependence</i>		<i>No Alcohol Dependence</i>		p	df	x <sup>2</sup>	<i>Alcohol Abuse</i>		<i>No Alcohol Abuse</i>		p	df	x <sup>2</sup>
	N	%	N	%				N	%	N	%			
MINI Diagnoses														
MDE current	5	(9.6)	32	(8.2)	0.73	1	0.12	5	(38.4)	31	(7.7)	0.00*	1	15.0
MDE recurrent	3	(5.7)	26	(6.7)	0.79	1	0.06	3	(23.0)	24	(6.0)	0.01*	1	6.01
MDE melancholic recurrent	3	(5.7)	20	(5.4)	0.84	1	0.03	3	(23.0)	19	(4.8)	0.00*	1	8.38
PTSD current	8	(15.3)	21	(5.3)	0.00*	1	7.6	5	(35.7)	21	(5.2)	0.00*	1	21.5

MINI = Mini International Neuro-Psychiatric International Interview

MDE = Major Depressive Episode

PTSD = Post Traumatic Stress Disorder

\*Statistically significant p values

**Table 9 Psychopathology in Women in Case Management (intake, 6 month follow-up, 12 month follow-up, 18 month follow-up)**

SCALE	INTAKE (N=50)		6 MONTH (N=50)		12 MONTH (N=50)		18 MONTH (N=50)		p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
AUDIT total	19.70	6.61	9.58	8.85	10.90	10.17	12.55	10.71	0.932
SSCL 51 total	17.79	20.98	10.23	15.37	9.30	12.47	9.46	13.59	0.221
Somatic Anxiety	3.97	4.08	2.15	3.46	2.00	2.90	2.43	3.46	0.017*
Decreased Energy	2.64	3.10	2.00	2.85	1.41	2.03	1.38	2.21	0.366
Depressed Mood	2.53	3.22	1.89	3.22	1.51	2.42	2.02	2.88	0.368
Hostility	2.02	2.62	1.20	2.06	1.05	1.98	0.76	1.52	0.024*
Anxious Mood	1.61	2.52	0.64	1.51	0.66	1.13	0.46	1.25	0.003*
Panic/Phobia	2.12	2.56	0.02	2.05	1.05	1.46	1.10	1.94	0.009*
Impaired Cognition	2.02	2.17	1.12	1.48	1.51	1.77	1.00	1.43	0.007*
Sleep Disturbance	0.23	0.77	0.12	0.65	0.15	0.70	0.10	0.64	0.591
Appetite Disturbance	0.81	1.30	0.24	0.76	0.18	0.65	0.18	0.61	0.002*
DTS total	4.14	13.92	-	-	-	-	-	-	-

AUDIT = Alcohol Use Disorder Identification Test

SSCL 51- Self-report Symptom Checklist

DTS - Davidson Trauma Scale (only administered at intake)

\*Statistically significant p values

**Table 10 Maternal Study: Trauma and Trauma-Related Symptoms**

	FAS (N=100)				NO FAS (N=400)				p
	Mean	SD	Min	Max	Mean	SD	Min	Max	
CTQ total	59.91	20.98	27.00	97.00	56.83	25.82	22.00	112.00	0.025*
Physical abuse	10.76	5.67	5.00	25.00	9.97	5.55	4.00	25.00	0.168
Physical neglect	14.51	6.26	5.00	25.00	14.02	7.65	5.00	25.00	0.001*
Sexual abuse	8.56	4.35	5.00	20.00	8.20	4.28	5.00	25.00	0.046*
Emotional abuse	11.31	5.55	5.00	25.00	9.79	4.51	21.00	53.00	0.000*
Emotional neglect	15.38	5.83	5.00	25.00	15.28	7.94	5.00	25.00	0.000*
DTS total	8.87	23.06	0.00	128.00	7.05	21.73	0.00	128.00	0.371
AUDIT total	8.49	5.22	0.00	24.00	3.31	2.24	0.00	17.00	0.000*
CAGE total	3.40	2.35	0.00	4.00	1.45	1.63	0.00	4.00	0.000*
SSCL 51 total	26.04	22.90	0.00	75.00	16.53	20.04	0.00	98.00	0.006*
Somatic Anxiety	3.79	4.19	0.00	15.000	3.18	3.78	0.00	16.00	0.863
Decreased Energy	2.66	2.89	0.00	12.000	2.36	2.89	0.00	12.00	0.381
Depressed Mood	3.30	3.87	0.00	14.000	2.29	3.40	0.00	16.00	0.102
Hostility	2.45	2.38	0.00	10.000	2.14	2.53	0.00	12.00	0.175
Anxious Mood	1.74	2.76	0.00	12.000	1.54	2.65	0.00	12.00	0.214
Panic/Phobia	2.60	2.94	0.00	12.000	2.16	2.95	0.00	14.00	0.146
Impaired Cognition	2.39	2.59	0.00	10.000	2.08	2.76	0.00	12.00	0.034*
Sleep Disturbance	0.53	1.05	0.00	4.000	0.48	1.01	0.00	4.00	0.952
Appetite Disturbance	0.69	1.09	0.00	4.000	0.56	1.04	0.00	4.00	0.084

\*Statistically significant p values

CTQ = Childhood Trauma Questionnaire

DTS = Davidson Trauma Scale

AUDIT = Alcohol Use Disorder Identification Test

CAGE = Cut down, Annoyed, Guilt, Eye-Opener

SSCL 51 = Self-report Symptom Checklist

### **6.6. Is the development of an alcohol use disorder more likely secondary to the onset of PTSD in women with lifetime PTSD? (Maternal Study)**

The mean age that women with an AUD and a diagnosis of PTSD started drinking alcohol regularly was 19.42 (SD=3.8), and the mean age that women with an AUD without a diagnosis of PTSD started drinking alcohol regularly was 17.81 (SD=2.6). Levene's test for equality of variances was statistically significant and the variances of the two groups were not homogenous ( $t(320) = -1.87, p=0.05$ ).

Although the data do not directly address the question of temporal ordering of these disorders, they suggest that in women with an AUD in whom a diagnosis of PTSD is also present, initiation of regular drinking occurs later in adulthood. It is possible that the initiation of drinking may have occurred after the onset of PTSD, although other contributory factors for a later age of drinking cannot be ruled out. In order to get a definitive answer, data on the age of onset of PTSD would be needed, but these were unfortunately not captured.

#### **Conclusion:**

In women with lifetime PTSD, indirect evidence suggests that the development of an AUD is more likely secondary to the onset of PTSD.

## **6.7. Are women with alcohol abuse/dependence and PTSD more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events relative to alcohol abusing/dependent women without PTSD? (Maternal Study and Case Management)**

### 6.7.1. Maternal Study

Significantly more women with an AUD (alcohol/abuse and dependence) and PTSD endorsed histories of intimate partner violence, compared to women with an AUD and without PTSD. Significant differences were found on the following forms of intimate partner violence: kicked, dragged or beaten ( $p=0.01$ ), choked or burned ( $p=0.01$ ), threatened with a weapon ( $p=0.02$ ), physically forced to have sex ( $p=0.05$ ), and sex out of fear ( $p=0.00$ ). These findings are summarised in Table 13.

Significantly more women with a diagnosis of alcohol dependence and alcohol abuse were victims of intimate partner violence ( $p=0.00$ ). This is summarised in Table 11. Significantly more women with a diagnosis of PTSD were victims of intimate partner violence ( $p=0.00$ ). The co-occurrence of partner violence and PTSD in the maternal questionnaire is summarised in Table 12.

The Childhood Trauma Questionnaire (CTQ) administered in the maternal study revealed the following (participants with a score of 3 on the denial/minimisation scale were not included in the results of the questionnaire, as it indicated minimisation or over-reporting): Women with an AUD and PTSD had an average score of 49 (low to moderate trauma) on the CTQ ( $M=49.00$ ,  $SD=5.40$ ). Women with an AUD

without PTSD had an average score of 53 (low to moderate trauma) on the CTQ ( $M=53.12$ ,  $SD=3.50$ ). Although women with an AUD without PTSD had a higher mean score, the difference between the groups was not statistically significant on the .05 level ( $t(40)=0.565$ ,  $p=.575$ ). Women with a diagnosis of alcohol dependence had higher rates of childhood trauma, although there was not a significant difference compared to women without a diagnosis of alcohol dependence ( $p=0.49$ ). This is illustrated in Figure 2.4. Women with a diagnosis of alcohol abuse had a higher prevalence of childhood trauma, although this was not statistically significant when compared to women without a diagnosis of alcohol abuse ( $p=0.48$ ). This is illustrated in Figure 2.6. The mean for the CTQ total score was 59.91 ( $SD=20.98$ ) in the FAS group and 56.83 ( $SD=25.82$ ) in the No FAS group – with both score totals indicating moderate to severe childhood trauma. Emotional neglect was the most prevalent form of childhood abuse in both the FAS group ( $M=15.38$ ,  $SD= 5.83$ ) and the No FAS group ( $M=15.28$ ,  $SD= 7.94$ ). Physical neglect was the second most prevalent form of childhood abuse in both the FAS group ( $M=14.51$ ,  $SD =6.26$ ) and the No FAS group ( $M=14.02$ ,  $SD= 7.66$ ). The mean of the CTQ total score and the subscale scores was slightly higher in the FAS group, compared to the No FAS group. The CTQ subscale scores and total scores are presented in Table 10. Women with a diagnosis of PTSD had higher rates of childhood trauma, but this was not statistically significant when compared to women without a diagnosis of PTSD ( $p=0.29$ ). The CTQ total score and PTSD diagnosis current (MINI) are illustrated in Figure 2.7. The difference between the FAS group and the No FAS group on the CTQ total is illustrated in Figure 2.9.

Questions about current stressors revealed the following about everyday stressful life events: Women with an AUD and PTSD experienced more stress with regard to alcohol or substance abuse (11.1%), marital and relationship problems (44.4%), problems with children/family (33.3%), unemployment and financial problems (33.3%) – with a statistically significant difference ( $p=0.00$ ). Stress relating to neighborhood problems (12.8%), health issues (6.4%), gossip and small living space (14.9%) were higher in women with an AUD without PTSD, although not statistically significant.

In the FAS group 28 women (28.0%) confirmed that their life was very stressful and 10 (10.0%) reported that it was severely stressful. In the No FAS group 76 women (19.0%) reported that their life was very stressful and 24 (6.0%) that their life was severely stressful. The difference between the FAS group and the No FAS group is statistically significant ( $p=0.00$ ). From the FAS group, 9 (9.0%) females reported that alcohol or substance abuse was a stressor in their lives, compared to 45 (11.3%) females in the No FAS group. Marital and relationship problems were less common amongst the No FAS group, with 75 out of 384 women (18.8%) compared to 26 out of a 100 (26.0%) women in the FAS group reporting that it was a current stressor in their lives. Problems with children/family were more prevalent in the FAS group with 28 out of 100 women (28.0%) affected by it, compared to 102 out of 384 women (25.5%) in the No FAS group. Unemployment and financial problems were reported by 13 (13.0%) of the 100 women in the FAS group and 53 (13.3%) out of 384 women in the No FAS group.

Neighbourhood problems affected 4 women (4.0%) in the FAS group and 10 women (2.5%) in the No FAS group. Anger problems were reported by 8 women (8.0%) in the FAS group and 13 women (3.3%)

in the No FAS group. Health issues, including HIV/AIDS, sickness and disability were a current stressor for 5 women (5.0%) in the FAS group and 14 women (3.5%) in the No FAS group. Other issues like gossip and small living space influenced 11 women (11.0%) in the FAS group and 51 women (12.8%) in the No FAS group.

#### 6.7.2. Case Management

In case management more women with a diagnosis of alcohol dependence and alcohol abuse were victims of intimate partner violence ( $p=0.00$ ). Significantly more women with a diagnosis of alcohol abuse were insulted ( $p=0.01$ ), had something thrown at them ( $p=0.05$ ), forced to have sex ( $p=0.05$ ), and threatened with a weapon ( $p=0.05$ ). However, the small sample of women in case management is a significant limitation.

The co-occurrence of intimate partner violence and alcohol abuse/dependence is summarised in Table 16. The co-occurrence of intimate partner violence and PTSD in case management is summarised in Table 17. There was not a statistically significant difference between women with and without a diagnosis of PTSD on intimate partner violence.

#### Conclusion:

The results of this study supported the hypothesis that women with alcohol abuse/dependence and PTSD had higher rates of intimate partner violence and everyday stressful life events. There was not a significant difference regarding early life trauma.



**Table 11 Maternal Study: Partner Violence and Alcohol Dependence and Alcohol Abuse**

Type of violence	<i>Alcohol Dependence</i>		<i>No Alcohol Dependence</i>		$\chi^2$	p	<i>Alcohol Abuse</i>		<i>No Alcohol Abuse</i>		$\chi^2$	p
	N	%	N	%			N	%	N	%		
Insulted	34	(63.0)	135	(34.4)	19.87	0.000*	10	(66.7)	144	(35.8)	5.92	0.051*
Restricted to house	19	(35.2)	96	(24.6)	10.26	0.005*	5	(33.3)	100	(24.9)	0.55	0.759
Yelled at	35	(64.8)	188	(48.0)	13.30	0.000*	11	(73.3)	194	(48.3)	3.64	0.162
Threatened	27	(50.0)	101	(25.9)	21.28	0.000*	8	(53.3)	107	(26.7)	5.13	0.076
Slapped	34	(63.0)	145	(37.3)	21.00	0.000*	9	(60.0)	154	(38.5)	2.80	0.246
Things thrown at	22	(40.7)	64	(16.4)	25.76	0.000*	8	(53.3)	70	(17.4)	12.27	0.002*
Pushed or shoved	31	(57.4)	111	(28.5)	18.15	0.000*	8	(53.3)	121	(30.2)	3.60	0.061
Hit with fist	24	(44.4)	81	(20.8)	14.80	0.000*	8	(53.3)	88	(22.0)	8.02	0.018*
Kicked/dragged/beaten	20	(37.0)	71	(18.1)	10.50	0.001*	7	(46.7)	77	(19.2)	6.80	0.009*
Choked/burned	14	(25.9)	28	(7.1)	19.63	0.000*	6	(40.0)	30	(7.5)	19.40	0.000*
Threatened – weapon	19	(35.2)	53	(14.0)	16.37	0.000*	6	(40.0)	61	(14.7)	6.58	0.010*
Physically forced to have sex	13	(25.0)	43	(11.0)	7.80	0.000*	3	(20.0)	46	(11.5)	1.01	0.314
Sex out of fear	12	(22.6)	35	(9.0)	9.29	0.000*	5	(33.3)	39	(10.0)	8.52	0.003*
Sexually humiliated	2	(4.0)	16	(4.0)	0.14	0.930	1	(7.1)	17	(4.3)	0.31	0.858

\*Statistically significant p value

**Table 12 Maternal Study: Partner Violence and PTSD**

Type of violence	PTSD		NO PTSD		p	x <sup>2</sup>
	N	%	N	%		
Insulted	18	(62.1)	151	(36.4)	0.000*	14.57
Restricted to house	13	(44.8)	102	(24.7)	0.000*	20.50
Yelled at	20	(68.9)	203	(48.9)	0.000*	19.50
Threatened	14	(48.3)	113	(27.4)	0.000*	20.63
Slapped	15	(51.7)	163	(39.6)	0.000*	16.31
Things thrown at	13	(44.8)	72	(17.4)	0.000*	28.01
Pushed or shoved	16	(55.2)	125	(30.3)	0.005*	7.68
Hit with fist	14	(48.3)	91	(22.0)	0.006*	10.33
Kicked, dragged or beaten	16	(55.2)	76	(18.3)	0.000*	22.42
Choked/burned	11	(37.9)	31	(7.7)	0.000*	29.45
Threatened - weapon	12	(41.4)	60	(15.0)	0.000*	14.48
Physical - forced sex	12	(41.4)	45	(10.8)	0.000*	22.50
Sex out of fear	12	(41.4)	36	(8.7)	0.000*	30.10
Sexually humiliated	5	(17.8)	14	(3.4)	0.001*	13.45

\*Statistically significant p value

**Table 13 Maternal Study: Intimate Partner Violence, PTSD and Alcohol Use Disorders (AUD)**

Type of violence	AUD	AUD	p	x <sup>2</sup>
	PTSD	PTSD		
	%	%		
Insulted	(87.5)	(59.6)	0.129	2.30
Restricted to house	(37.5)	(36.2)	0.942	0.00
Yelled at	(87.5)	(63.8)	0.187	1.74
Threatened	(62.5)	(42.6)	0.295	1.09
Slapped	(75.0)	(61.7)	0.470	0.52
Thrown	(62.5)	(38.3)	0.200	1.64
Pushed or shoved	(77.8)	(48.9)	0.112	2.52
Hit with fist	(66.7)	(38.3)	0.115	2.48
Kicked, dragged or beaten	(77.8)	(29.8)	0.006*	7.42
Choked/burned	(55.6)	(17.0)	0.012*	6.29
Threatened - weapon	(66.7)	(27.7)	0.024*	5.12
Physical - forced sex	(44.4)	(15.2)	0.045*	4.01
Sex out of fear	(66.7)	(13.0)	0.000*	12.69
Sexually humiliated	(12.5)	(2.2)	0.160	1.97

\*Statistically significant p value

**Table 14 Maternal Study: Intimate Partner Violence and FAS**

Type of violence	FAS (n=100)		No FAS (n=400)		p
	N	%	N	%	
<i>Insulted</i>	42	(42.0)	130	(32.6)	0.05*
1-5 times in last 6 months	20	(20.0)	39	(9.8)	
6 or more times	10	(10.0)	28	(7.0)	
<i>Not allowed to leave house</i>	31	(31.0)	85	(21.3)	0.02*
1-5 times in last 6 months	8	(8.0)	31	(7.8)	
6 or more times	11	(11.0)	14	(3.5)	
<i>Yelled at</i>	57	(57.0)	169	(42.4)	0.00*
1-5 times in last 6 months	17	(17.0)	65	(16.3)	
6 or more times	17	(17.0)	32	(8.0)	
<i>Threatened to hurt you</i>	37	(37.0)	93	(23.3)	0.00*
1-5 times in last 6 months	10	(10.0)	32	(8.0)	
6 or more times	8	(8.0)	18	(4.5)	
<i>Slapped</i>	47	(47.0)	133	(33.3)	0.00*
1-5 times in last 6 months	14	(14.0)	37	(9.3)	
6 or more times	9	(9.0)	9	(2.3)	
<i>Threw something at you</i>	27	(27.0)	60	(15.0)	0.00*
1-5 times in last 6 months	6	(6.0)	21	(5.3)	
6 or more times	7	(7.0)	8	(2.0)	
<i>Pushed or shoved you</i>	40	(40.0)	104	(26.1)	0.00*
1-5 times in last 6 months	11	(11.0)	34	(8.5)	
6 or more times	9	(9.0)	12	(3.0)	
<i>Hit you with his fist</i>	36	(36.0)	70	(17.5)	0.00*
1-5 times in last 6 months	5	(5.0)	21	(5.3)	
6 or more times	9	(9.0)	10	(2.5)	
<i>Kicked, dragged or beat you</i>	30	(30.0)	63	(15.8)	0.00*
1-5 times in last 6 months	4	(4.0)	18	(4.5)	
6 or more times	7	(7.0)	8	(2.0)	
<i>Choked or burned</i>	16	(16.0)	27	(6.8)	0.00*

1-5 times in last 6 months	1	(1.0)	10	(2.5)	
6 or more times	6	(6.0)	4	(1.0)	
<i>Threatened or used weapon</i>	25	(25.0)	48	(12.0)	0.00*
1-5 times in last 6 months	2	(2.0)	16	(4.0)	
6 or more times	5	(5.0)	5	(2.3)	
<i>Physically forced sex</i>	12	(12.0)	46	(11.0)	0.67
1-5 times in last 6 months	5	(5.0)	17	(4.3)	
6 or more times	1	(1.0)	4	(1.0)	
<i>Sex because of fear</i>	10	(10.0)	39	(9.8)	0.74
1-5 times in last 6 months	4	(4.0)	14	(3.5)	
6 or more times	1	(1.0)	4	(1.0)	
<i>Sexually humiliated</i>	4	(4.0)	16	(4.0)	0.87
1-5 times in last 6 months	1	(1.0)	5	(1.3)	
6 or more times	1	(1.0)	1	(0.3)	

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\*Statistically significant p values

**Table 15 Partner Violence in Case Management at Intake, 6 month, 12 month & 18 month follow-up**

Type of violence	Intake		6 months		12 months		18 months		p
	(n=50)		(n=50)		(n=50)		(n=50)		
	N	%	N	%	N	%	N	%	
Insulted	17	(34.0)	13	(26.0)	12	(24.0)	16	(32.0)	0.076
Not allowed to leave house	18	(36.0)	6	(12.0)	7	(14.0)	8	(16.0)	0.003*
Yelled at	26	(52.0)	23	(46.0)	22	(44.0)	25	(50.0)	0.288
Threatened to hurt you	16	(32.0)	9	(18.0)	12	(24.0)	11	(22.0)	0.501
Slapped you	25	(50.0)	22	(44.0)	19	(38.0)	20	(40.0)	0.863
Threw something at you	6	(12.0)	3	(6.0)	3	(6.0)	7	(14.0)	0.373
Pushed or shoved you	15	(30.0)	12	(24.0)	13	(26.0)	11	(22.0)	0.859
Hit you with his fist	6	(12.0)	6	(12.0)	2	(4.0)	9	(18.0)	0.100
Kicked, dragged or beat you	6	(12.0)	5	(10.0)	5	(10.0)	10	(20.0)	0.052*
Choked or burned you	6	(12.0)	4	(8.0)	2	(4.0)	5	(10.0)	0.375
Threatened or used weapon	4	(8.0)	2	(4.0)	3	(6.0)	6	(12.0)	0.289
Physically forced sex	7	(14.0)	3	(6.0)	1	(2.0)	2	(4.0)	0.419
Sex because of fear	4	(8.0)	2	(4.0)	1	(2.0)	1	(2.0)	0.398
Sexually humiliated	49	(98.0)	-	-	40	(80.0)	38	(76.0)	-

\*Statistically significant p value

**Table 16 Partner violence and Alcohol Abuse/Dependence in Case Management at intake**

Type of violence	Total sample (n=50)		Alcohol Dependence (n=35)		No Alcohol Dependence (n=13)		p	x <sup>2</sup>	Alcohol Abuse (n=7)		No Alcohol Abuse (n=7)		p	x <sup>2</sup>
	N	%	N	%	N	%			N	%	N	%		
Insulted	17	(34.0)	15	(31.1)	2	(4.2)	0.07	3.13	4	(28.6)	0	(0.0)	0.01*	5.60
Yelled at	26	(52.0)	21	(43.8)	5	(10.4)	0.18	1.77	4	(28.6)	2	(14.3)	0.28	1.17
Threatened to hurt	16	(32.0)	12	(25.0)	4	(8.3)	0.81	0.53	4	(28.6)	1	(7.1)	0.94	2.80
Slapped you	25	(50.0)	18	(38.8)	7	(14.8)	0.95	0.00	5	(35.7)	3	(21.4)	0.28	1.17
Something thrown at	6	(12.0)	4	(8.3)	2	(4.2)	0.71	0.14	3	(21.4)	0	(0.0)	0.05*	3.82
Pushed/shoved	15	(30.0)	10	(20.8)	5	(10.4)	0.51	0.43	3	(21.4)	2	(14.3)	0.57	0.31
Hit you with fist	6	(12.0)	5	(10.4)	1	(2.1)	0.53	0.38	2	(14.3)	0	(0.0)	0.12	2.33
Kicked/dragged/beaten	6	(12.0)	3	(6.3)	3	(6.3)	0.17	1.82	3	(21.4)	1	(7.1)	0.23	1.40
Choked/burned	6	(12.0)	4	(8.3)	2	(4.2)	0.71	0.14	2	(14.3)	0	(0.0)	0.12	2.33
Threatened - weapon	4	(8.0)	3	(6.3)	1	(2.1)	0.92	0.01	3	(21.4)	0	(0.0)	0.05*	3.82
Physically forced sex	7	(14.0)	6	(12.5)	1	(2.1)	0.40	0.68	3	(21.4)	0	(0.0)	0.05*	3.82
Sex because of fear	4	(8.0)	3	(6.3)	1	(2.1)	0.92	0.01	2	(14.3)	0	(0.0)	0.12	2.33

\*Statistically significant p value

**Table 17** Case Management: Partner violence and PTSD

Type of violence	PTSD		NO PTSD		p	x <sup>2</sup>
	N	%	N	%		
Insulted	1	(3.7)	9	(33.3)	0.693	0.16
Restricted to house	1	(3.7)	11	(40.7)	0.869	0.02
Yelled at	1	(3.7)	14	(51.9)	0.869	0.02
Threatened	0	(0.0)	10	(37.0)	0.259	1.27
Slapped	0	(0.0)	6	(50.0)	1.000	0.00
Thrown at	0	(0.0)	4	(14.8)	0.539	0.38
Pushed or shoved	1	(3.7)	10	(37.0)	0.781	0.77
Hit with fist	0	(0.0)	4	(14.8)	0.542	0.38
Kick/drag/beat	0	(0.0)	6	(22.2)	0.432	0.62
Choked/burned	0	(0.0)	4	(14.8)	0.539	0.38
Threatened - weapon	0	(0.0)	3	(11.1)	0.603	0.27
Physical forced sex	1	(3.7)	3	(11.1)	0.145	2.12
Sex out of fear	0	(0.0)	2	(7.4)	0.678	0.17

\*Statistically significant p value

**6.8. Will women with alcohol use disorders (AUD's) and PTSD who enter case management have worse drinking outcomes than those without PTSD? (Case Management)**

Two women (4.0%) had a score of 40 or more on the Davidson Trauma Scale that indicated PTSD. The MINI's PTSD module also indicated that 2 women (4.0%) have a diagnosis of PTSD. A significant relationship was found between the PTSD diagnosis at intake and the SSCL 51 Total score at intake ( $p=0.042$ ). The SSCL 51 total score for women at different time intervals with and without a diagnosis of PTSD is illustrated in Figure 2.12.

More than half the women (70.0%) had a diagnosis of current alcohol dependence according to the MINI at intake. Only 14.0% of the women had a diagnosis of current alcohol abuse at intake. Of the 50 women in case management, 31 (62.0%) reported that they were currently using alcohol.

Of the 2 women (4.0%) that had a diagnosis of PTSD at intake, 1 (2.0%) had a score of 8 or higher on the AUDIT at 6 months follow-up, indicating high risk drinking. There was no significant difference between women with and without PTSD with respect to AUDIT scores at the different time intervals (intake, 6, 12 and 18 months follow-up) as illustrated by Figure 2.13,  $F(3,90) = 1.07$ ,  $p = 0.360$ .

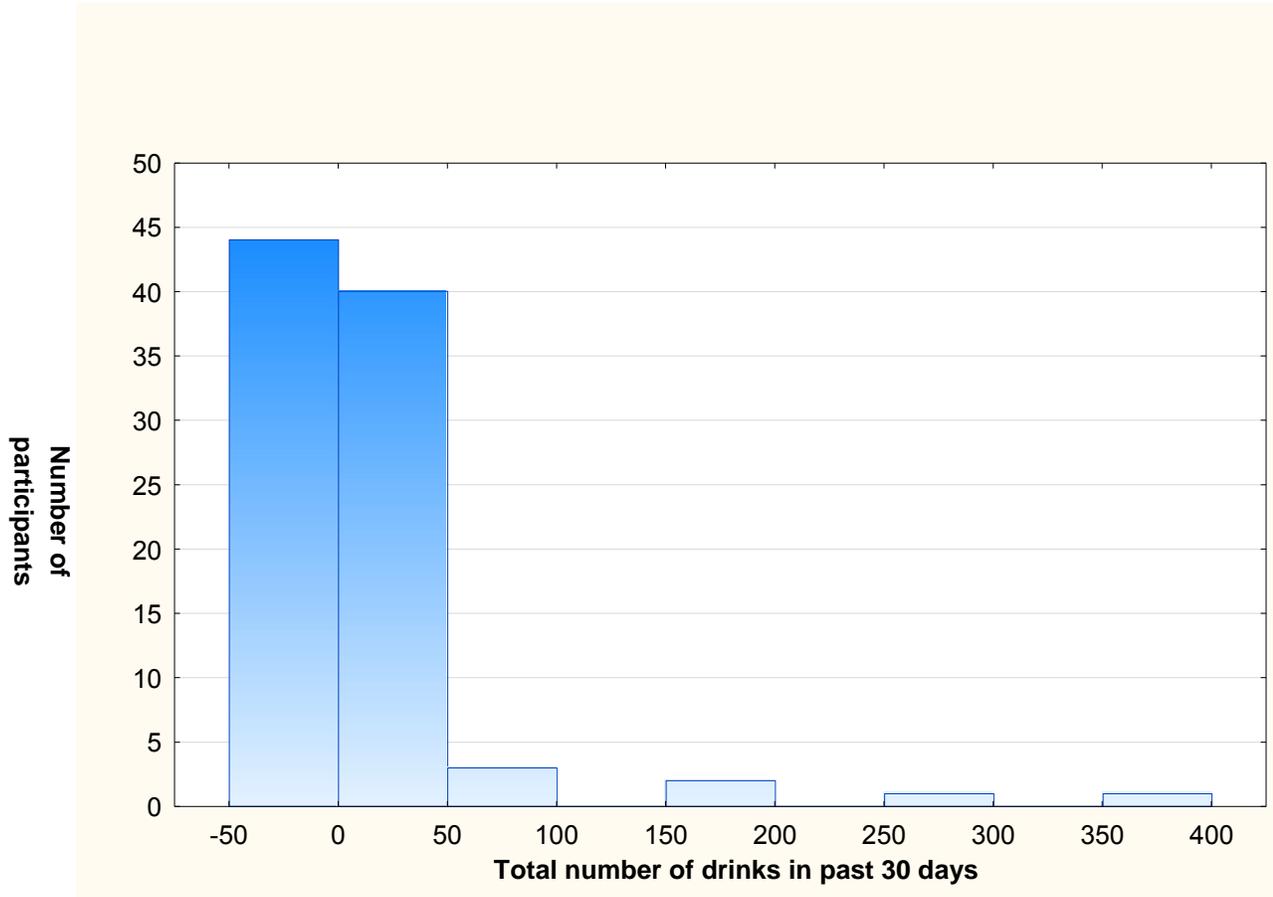
Although the difference was not significant, the PTSD group had higher scores on the AUDIT at intake, 6 months follow-up and 12 months follow-up, suggesting a longer time to improvement (i.e. reduction in drinking). The AUDIT score of the group with PTSD was lower than the the group without PTSD at 18 months follow-up. There was a significant correlation between the AUDIT total score and the SSCL 51 total score at 6 months follow-up,  $r=.39$ ,  $p$  (one-tailed)  $p= .05$ . The mean for the AUDIT score at intake

was 19.70 (SD=6.61) which indicated high risk drinking. The mean at 18 months-follow up was 9.46 (SD=13.59) which was lower, although still indicative of high risk drinking.

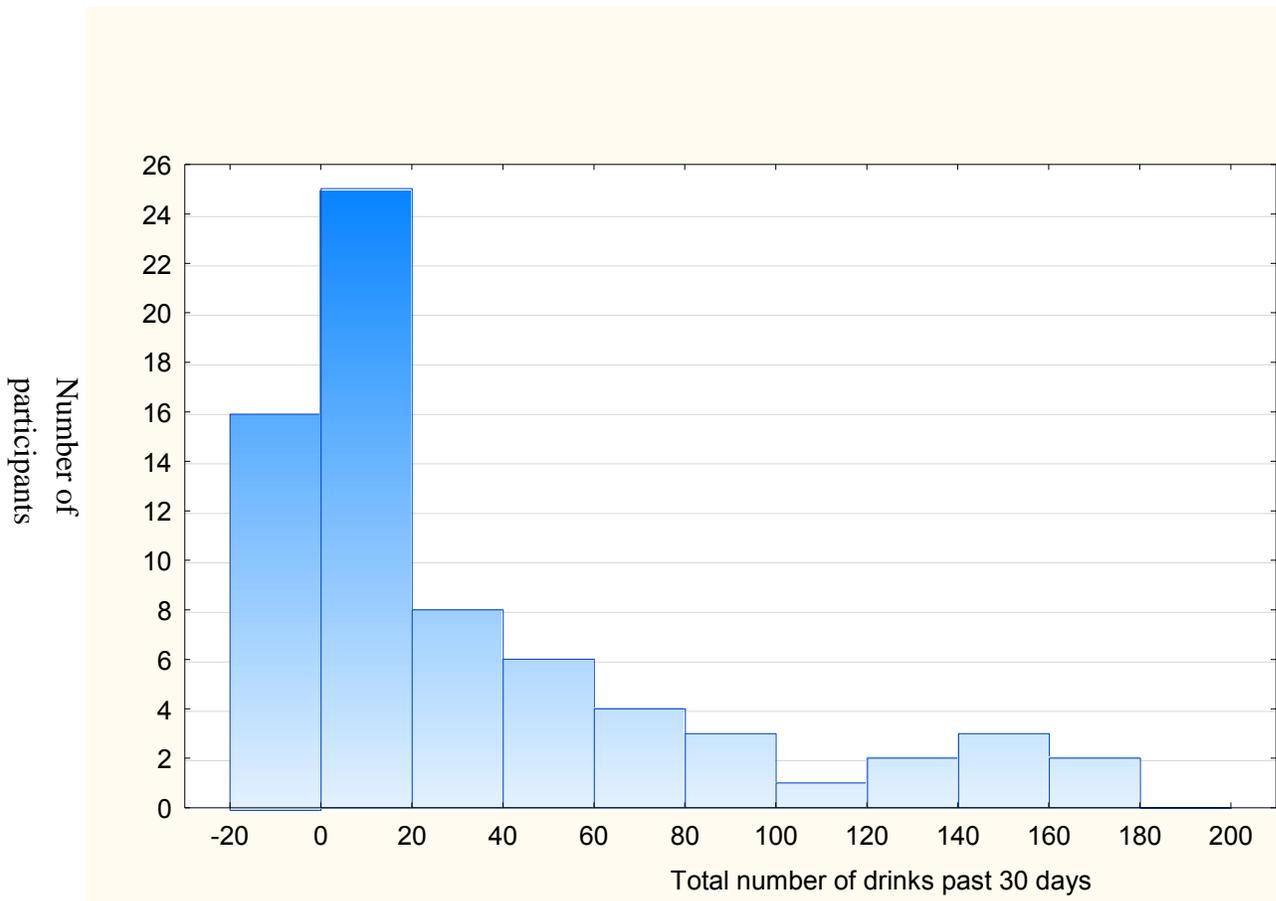
Conclusion:

The small sample of women in case management is a major limitation, and, only two women met criteria for PTSD as such, these analyses were not statistically powered to detect group differences (women with and without PTSD) with respect to drinking outcomes.

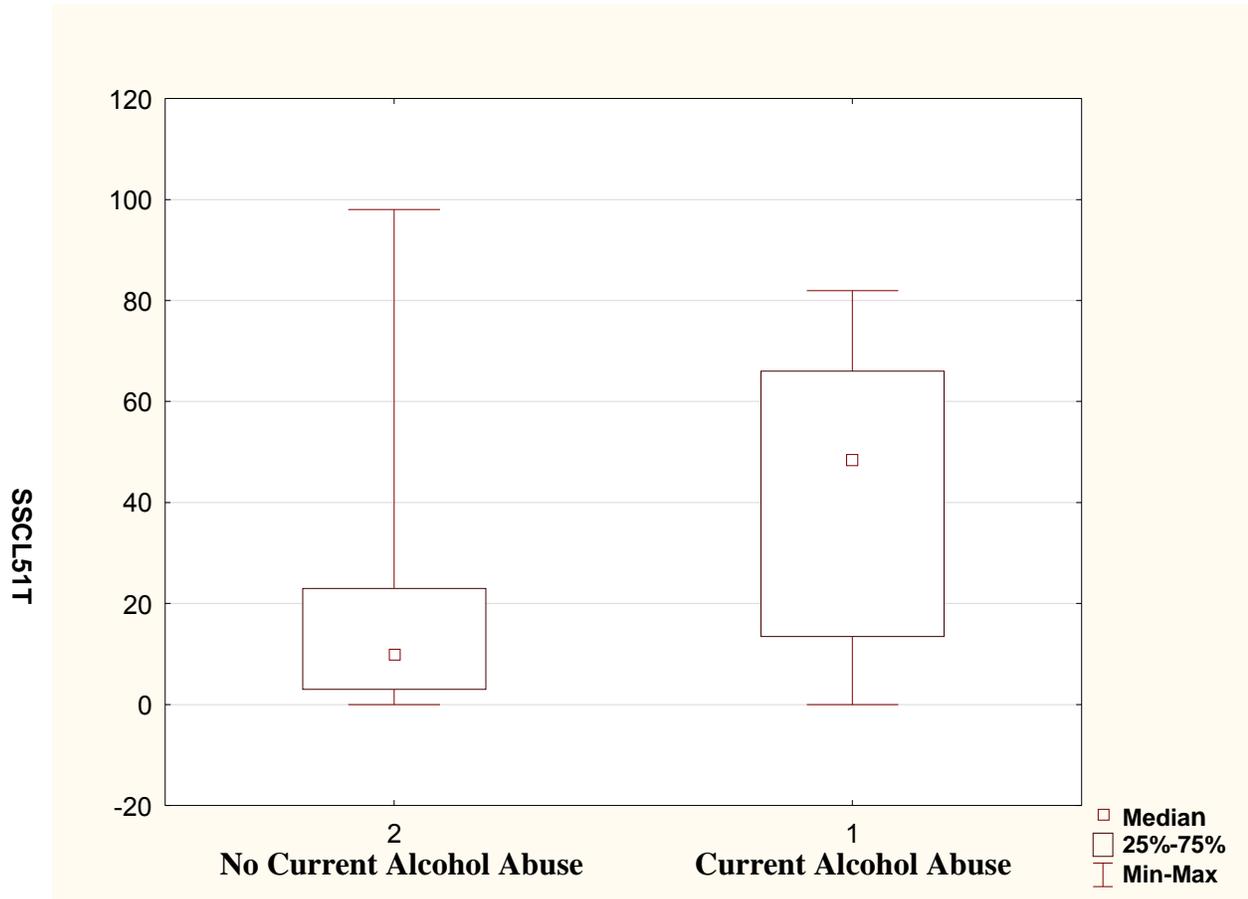
**Figure 1.1 Wellington Community Survey - Drinks in the Past 30 days**



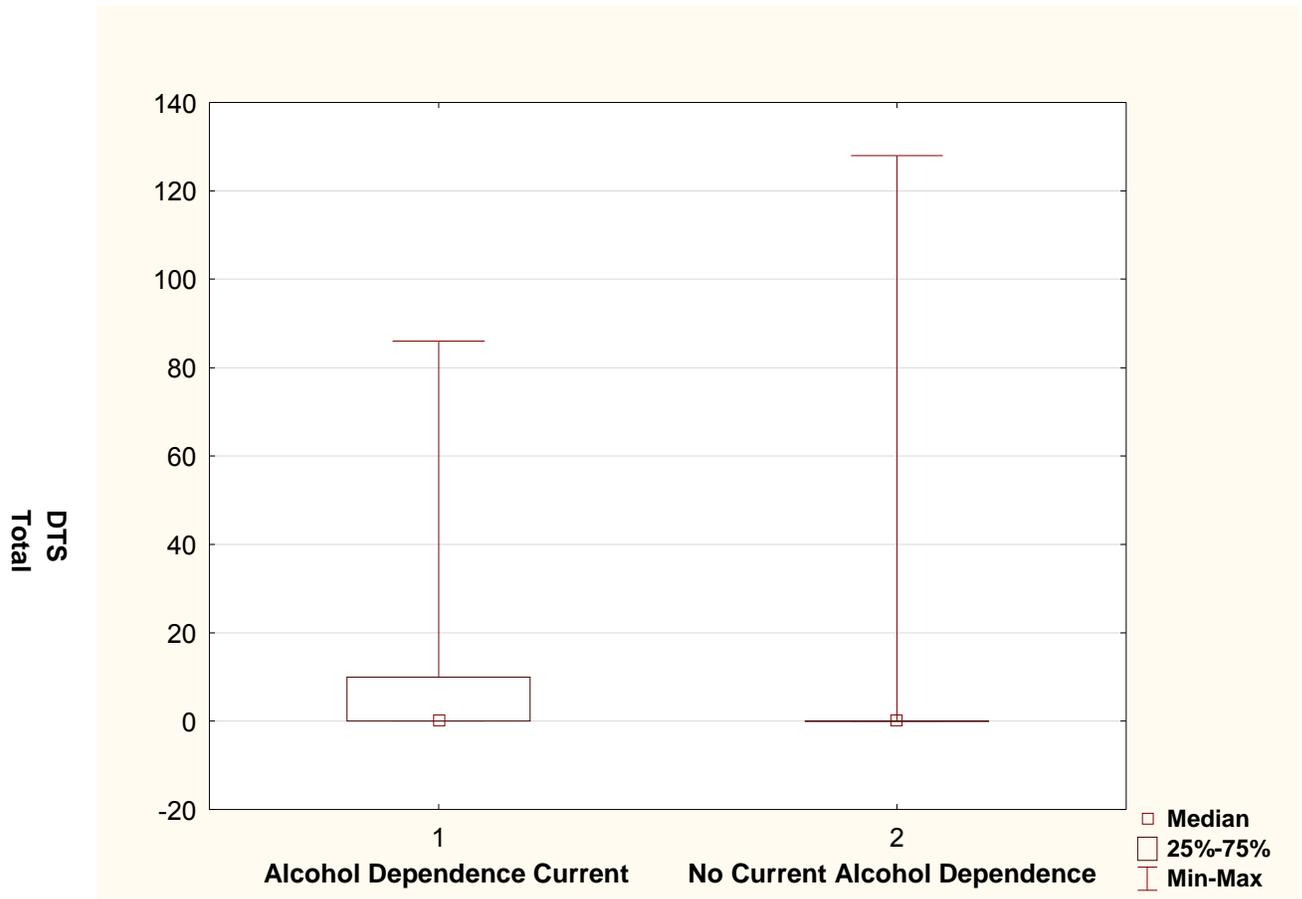
**Figure 1.2 BRAM community survey-drinks in the past 30 days**



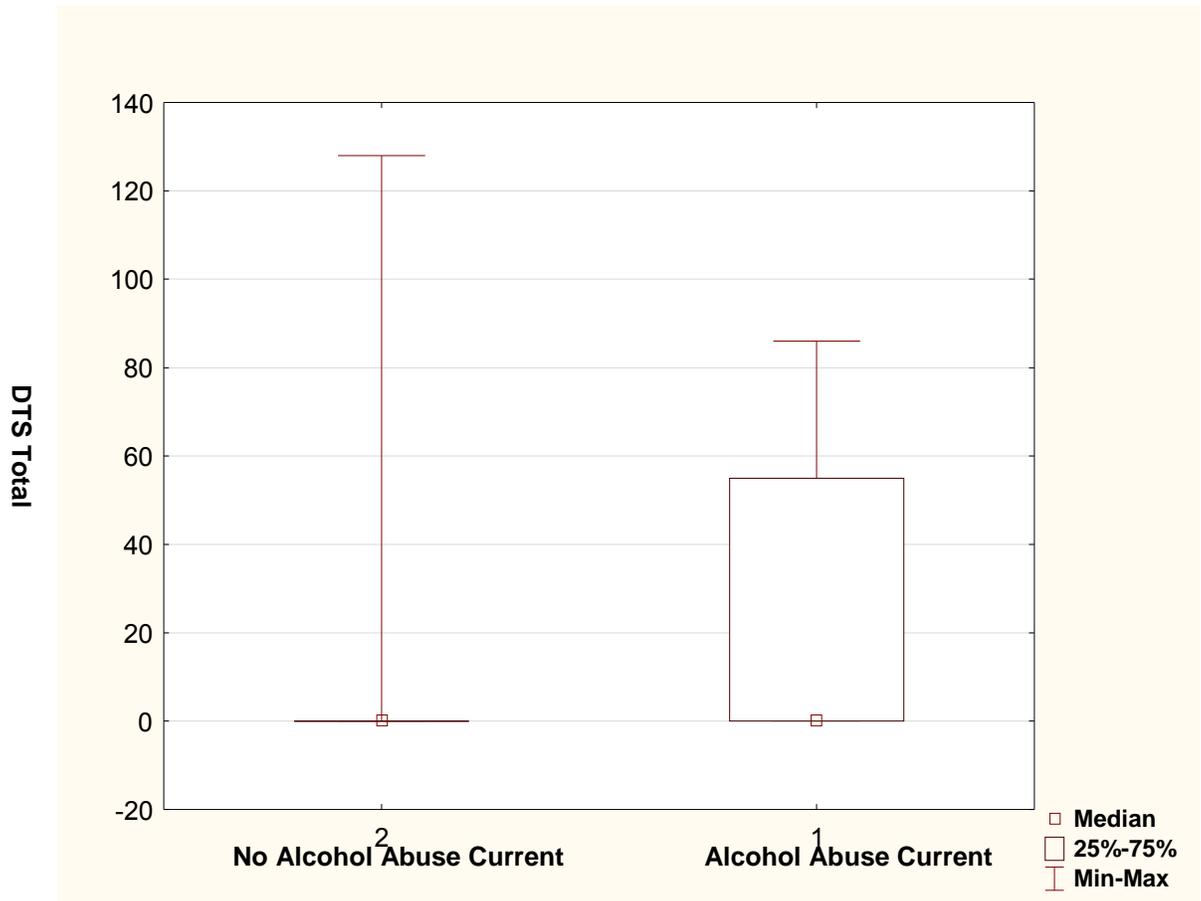
**Figure 2.1 Maternal Study: SSCL 51 Total and Current Alcohol Abuse (M.I.N.I.)**  
( $p=0.001$ ;  $Z=-3.180$  - Mann-Whitney U Test)



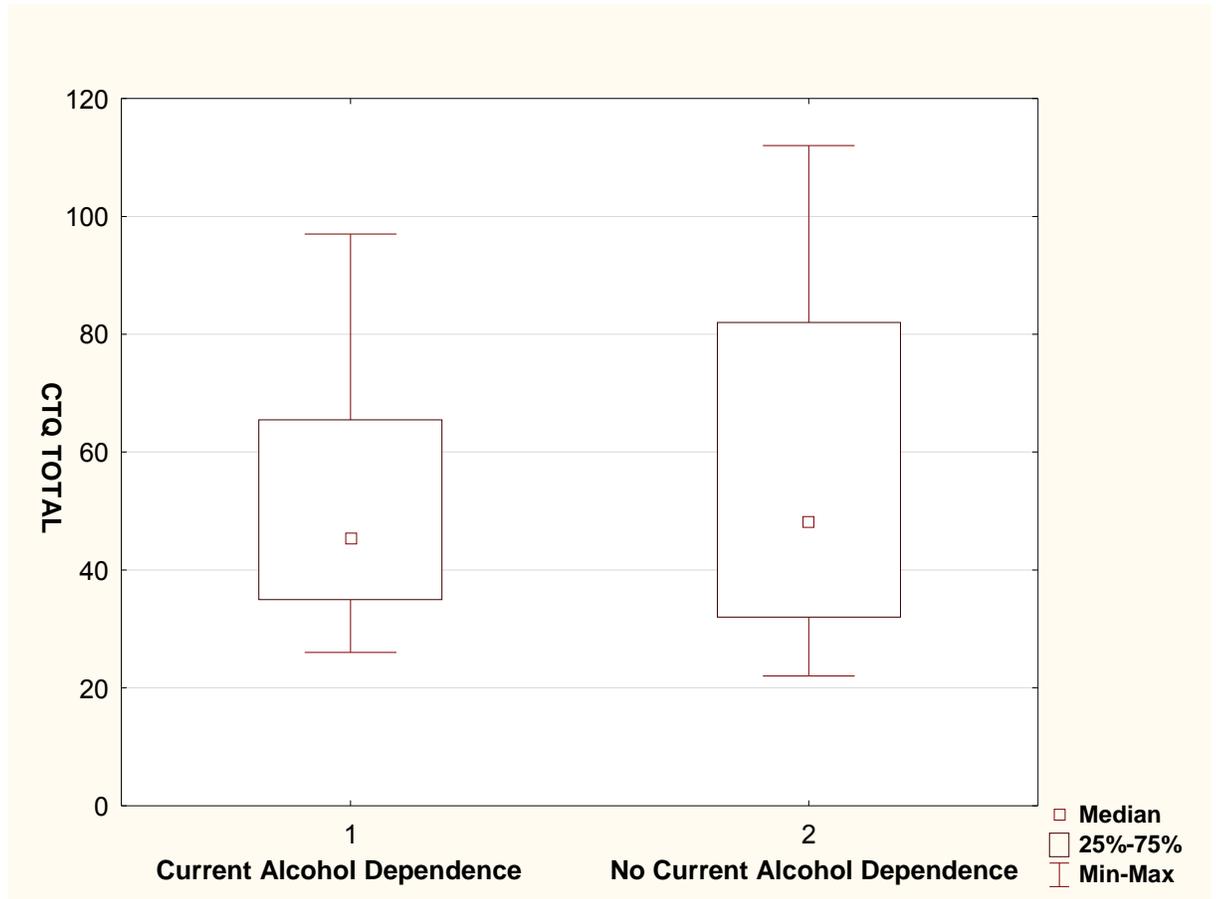
**FIGURE 2.2 Maternal Study: Davidson Trauma Scale Total Score and Alcohol Dependence Current (M.I.N.I.)** ( $p=0.202$ ;  $Z=1.789$  – Mann-Whitney U Test)



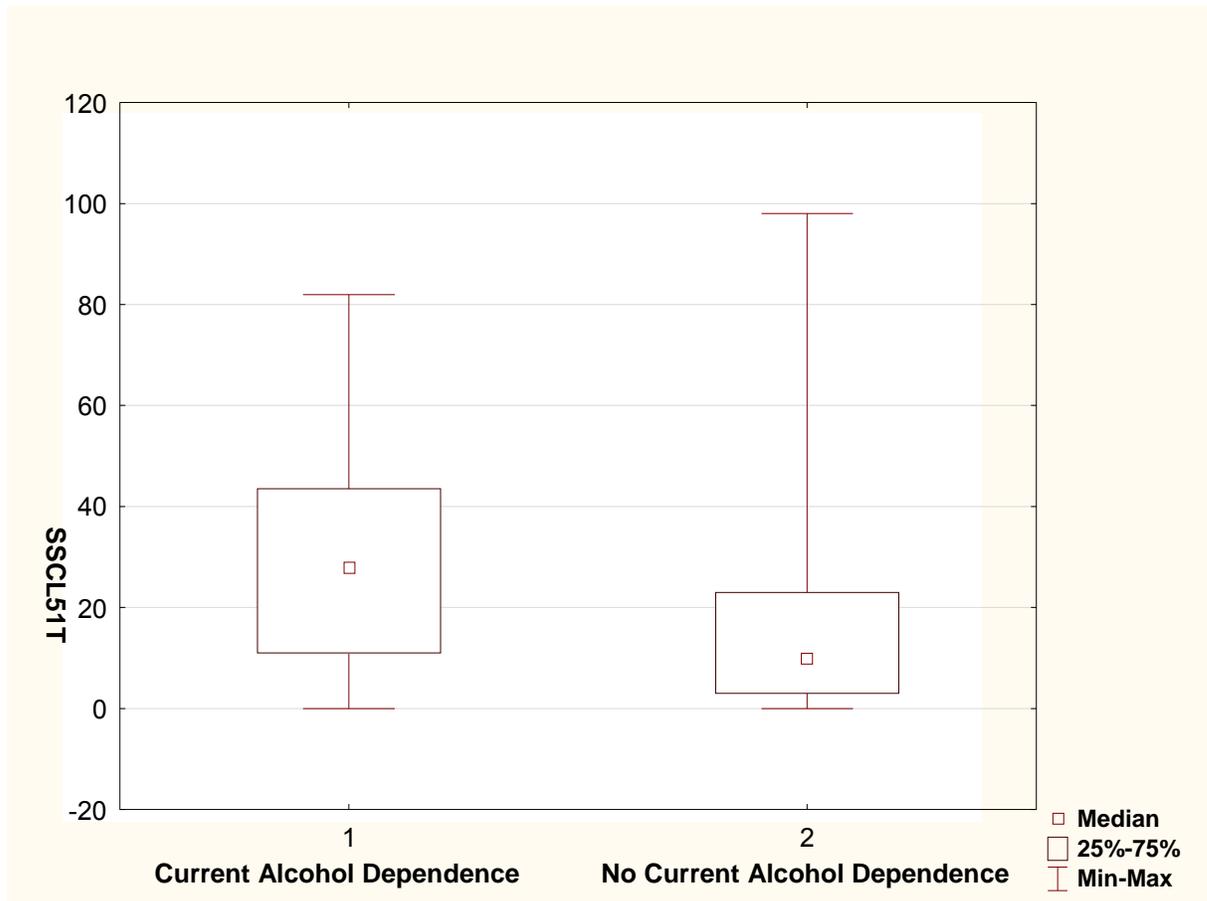
**FIGURE 2.3 Maternal Study: Davidson Trauma Scale and Alcohol Abuse Current (M.I.N.I.)** ( $p=0.280$ ;  $Z=-1.533$  - Mann-Whitney U Test)



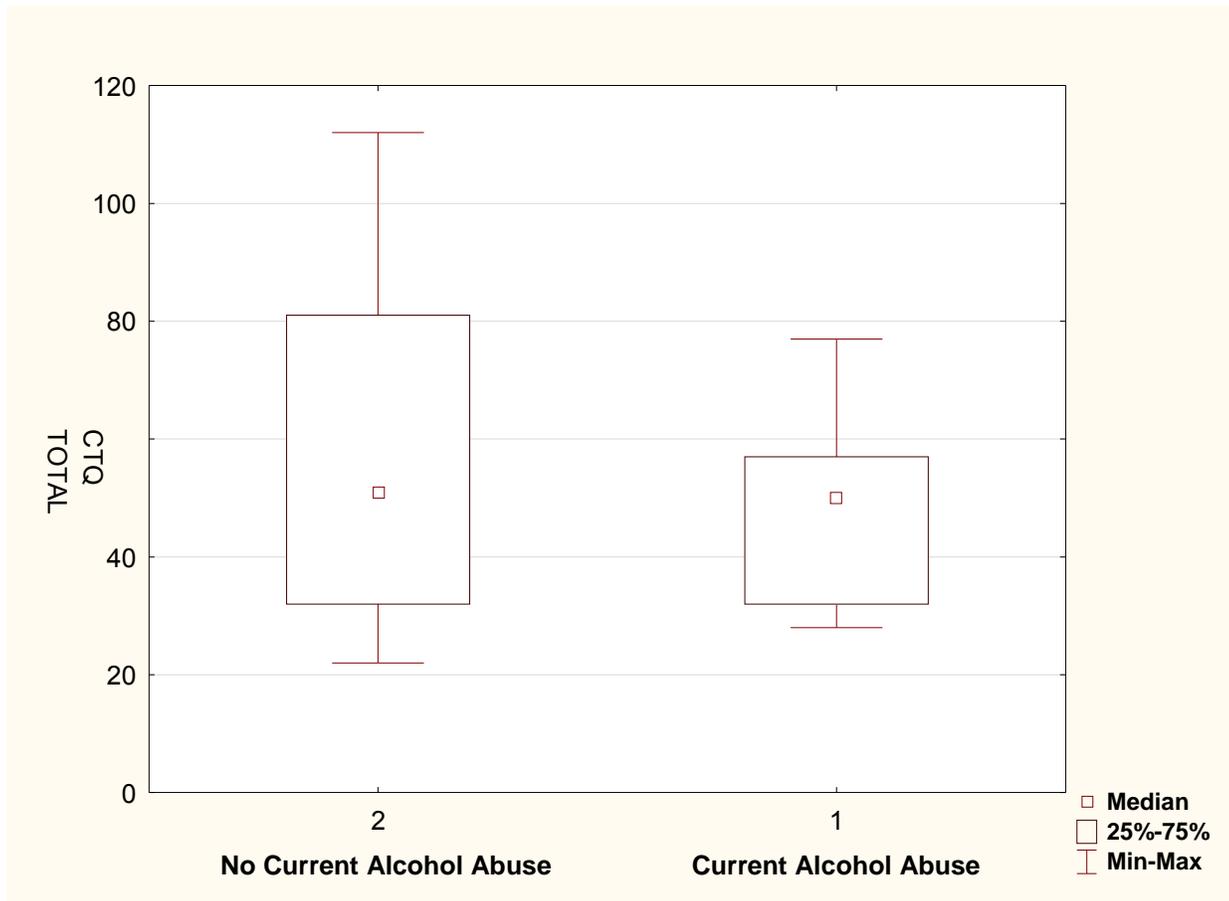
**Figure 2.4 Childhood Trauma Questionnaire and Current Alcohol Dependence (M.I.N.I.)**  
( $p=0.487$ ;  $Z=0.694$  – Mann-Whitney U Test)



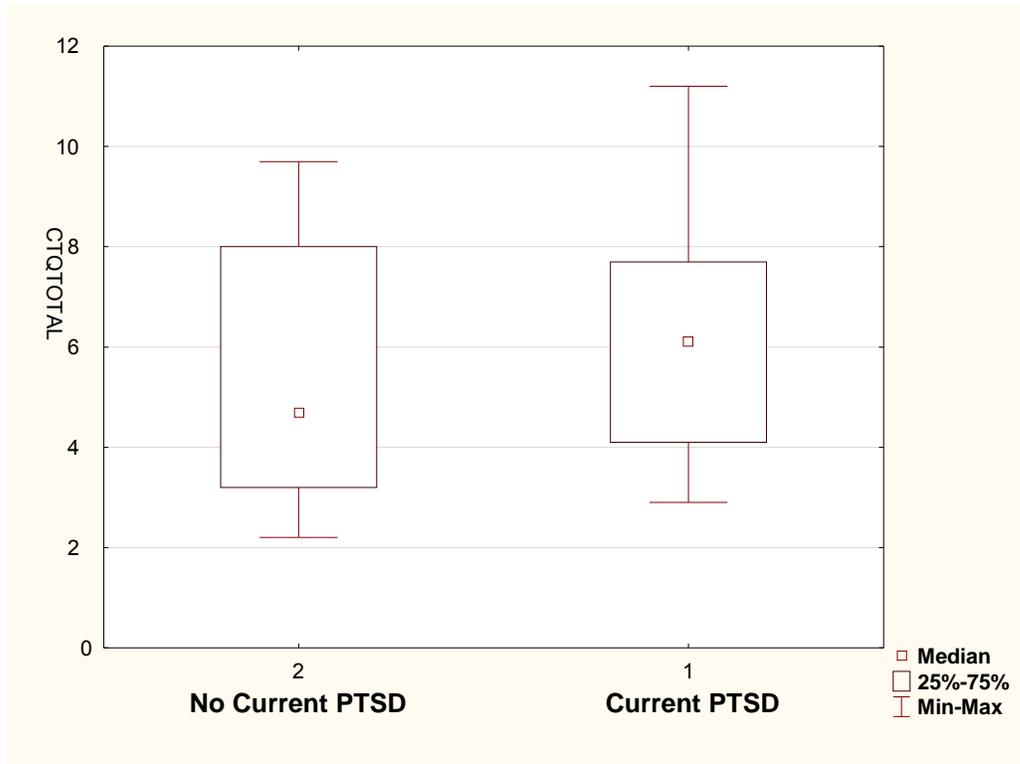
**Figure 2.5 Maternal Study: SSCL 51 Total and Current Alcohol Dependence (M.I.N.I.)**  
( $p=0.000$ ;  $Z=3.729$ - Mann – Whitney U Test)



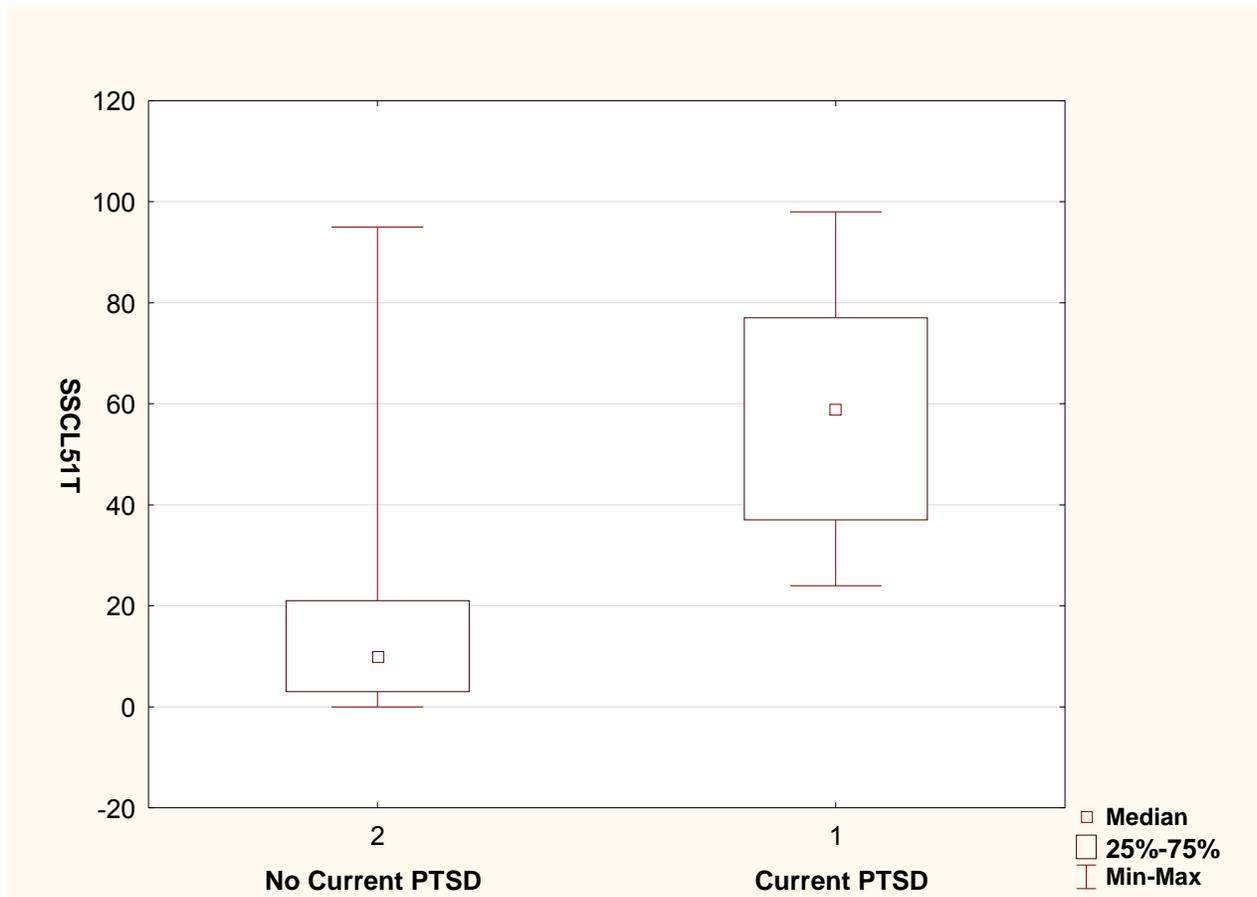
**Figure 2.6 Maternal Study: Childhood Trauma Questionnaire and Current Alcohol Abuse (M.I.N.I.)** ( $p=0.476$ ;  $Z=0.712$  – Mann-Whitney U Test)



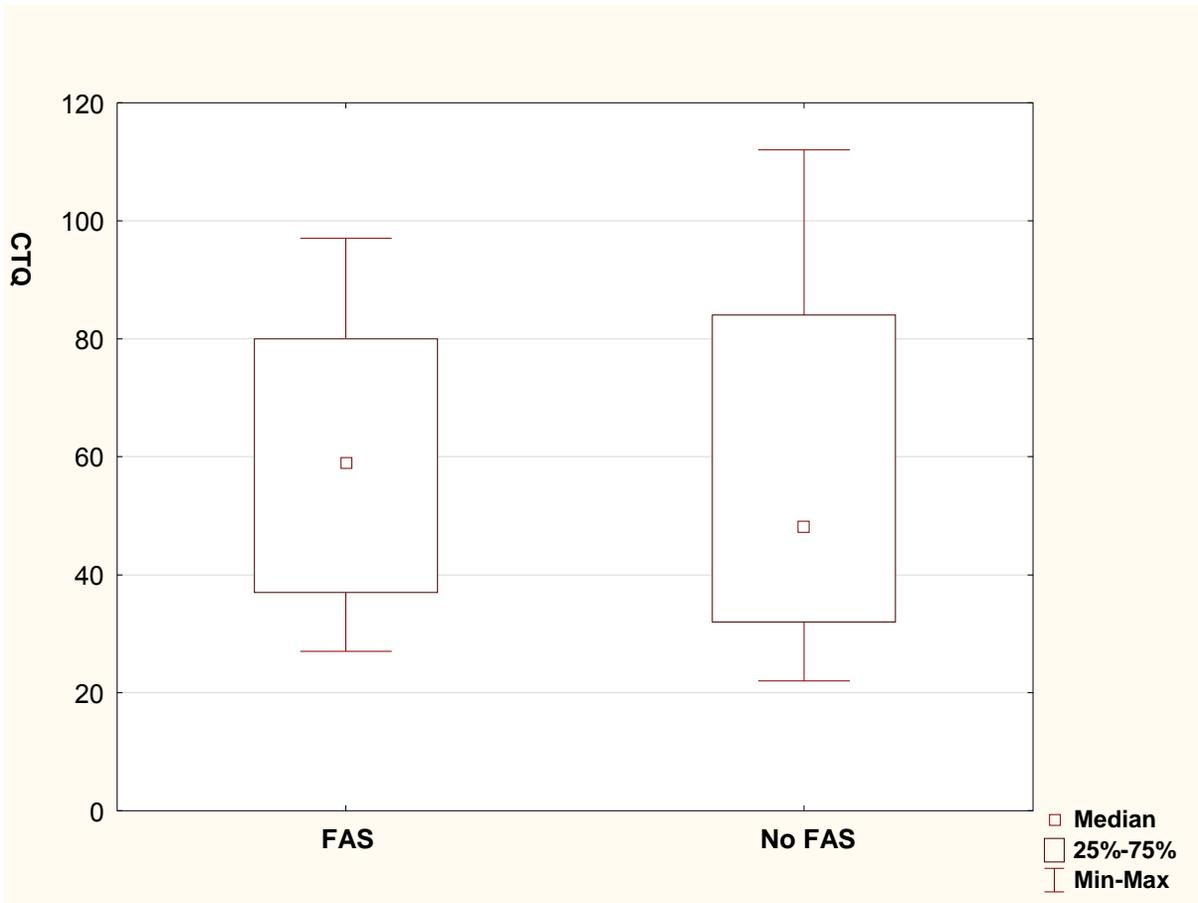
**Figure 2.7 Maternal Study: Childhood Trauma Questionnaire and PTSD (M.I.N.I.)**  
( $p=0.295$ ;  $Z=-1.046$  – Mann-Whitney U Test)



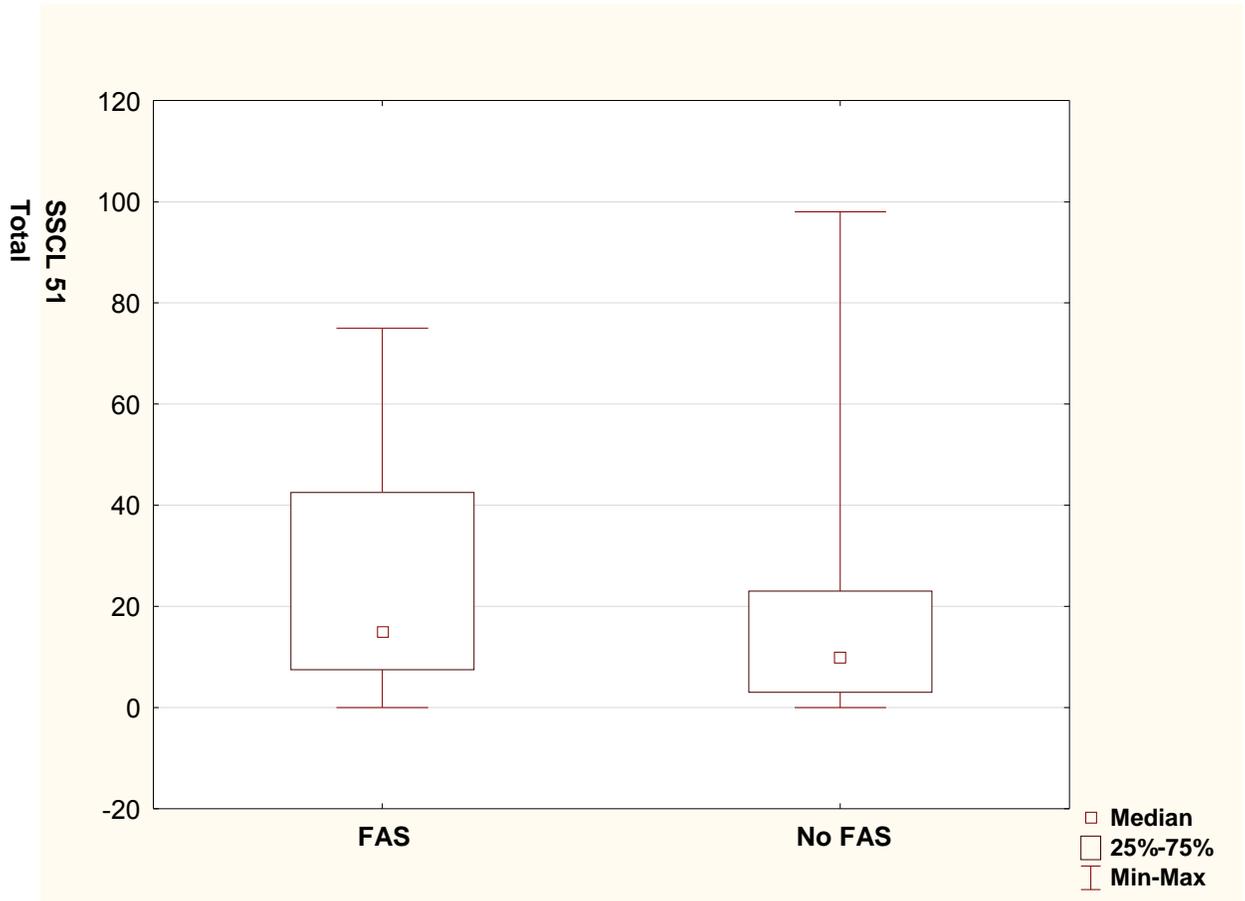
**Figure 2.8 Maternal Study: SSCL 51 Totals and Current PTSD (M.I.N.I.)** ( $p=0.000$ ;  $Z=-7.683$  – Mann-Whitney U Test)



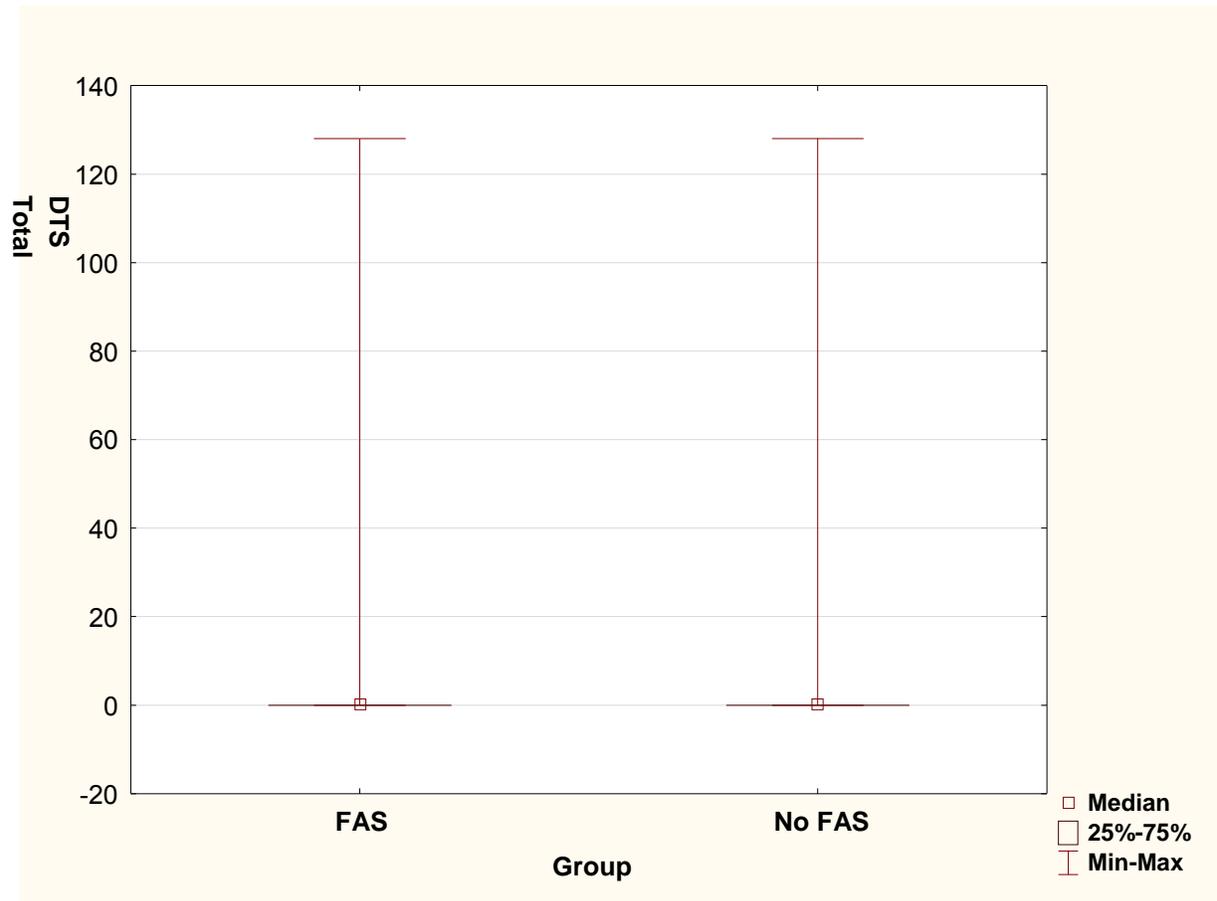
**Figure 2.9 Maternal Study: Childhood Trauma Questionnaire – FAS and No FAS**  
( $p=0.415$ ;  $Z=0.814$  – Mann-Whitney U Test)



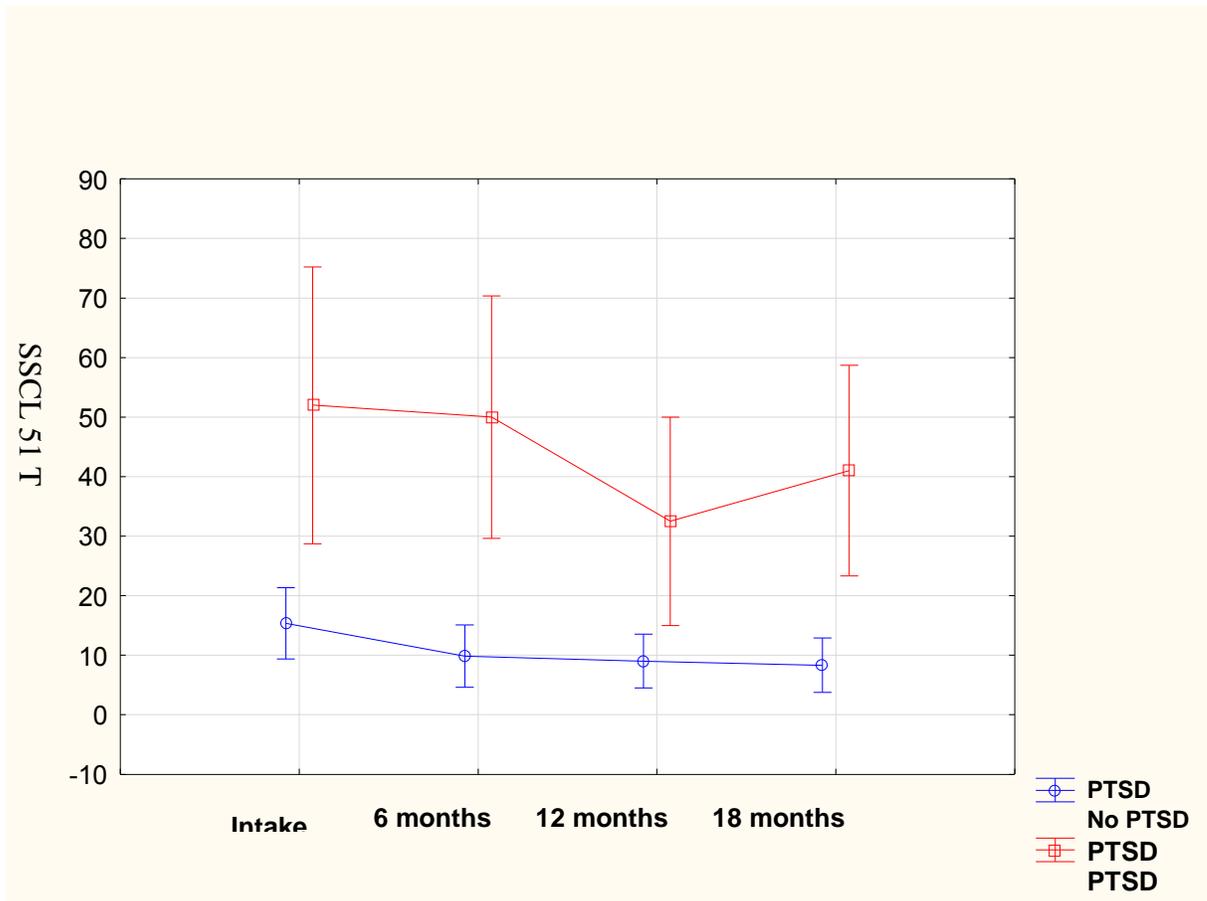
**Figure 2.10 Maternal Study: SSCL 51 Totals for FAS and no FAS**  
( $p=0.001$ ;  $Z=3.211$  – Mann-Whitney U Test)



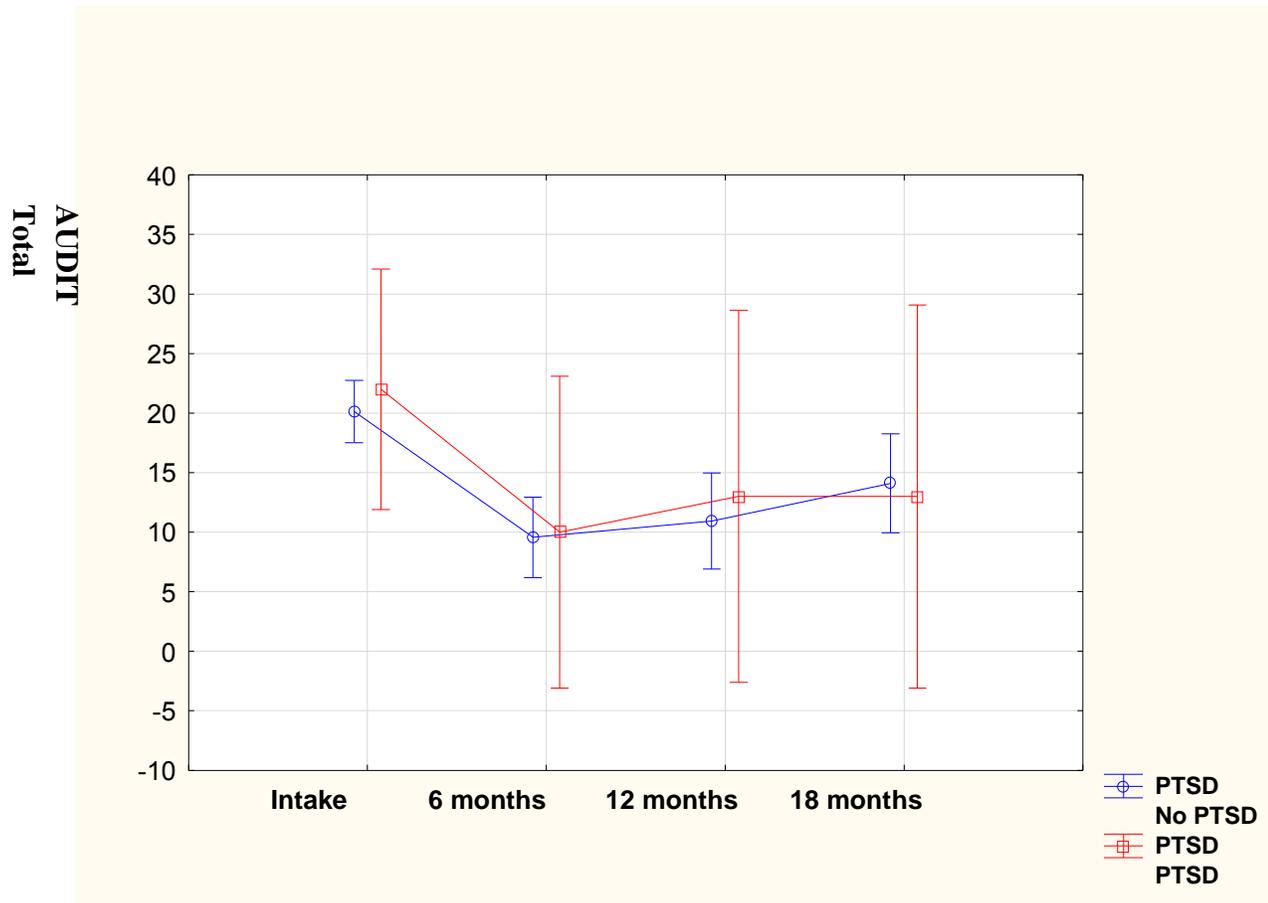
**Figure 2.11 Maternal Study: Davidson Trauma Scale for FAS and No FAS**  
( $P=0.696$ ;  $Z=0.563$  – Mann-Whitney U Test)



**Figure 2.12 SSCL51 Total in Case Management (Intake, 6, 12 and 18 month follow-ups)**  
( $F(3,90) = 2.7106, p=0.497$  – RMANOVA)



**Figure 2.13 AUDIT in Case Management (intake, 6, 12 and 18 months follow-up) (F (3.90) = 0.9265, p=0.963 – RMANOVA)**



## CHAPTER 7

### DISCUSSION

#### 7.1 Introduction

The broad objective of this study was to investigate the prevalence of trauma, Post-Traumatic Stress Disorder (PTSD) and other psychopathologies in women with an alcohol use disorder (alcohol abuse or dependence (AUD)). The principal aim of the study was to establish the relationship between the traumatic exposure, onset of PTSD, and the severity and course of AUDs and other psychopathologies (e.g. depression, other anxiety symptoms, other substance misuse). The following objectives were derived from this principal aim:

- 1) To determine if the development of an AUD is secondary to the onset of PTSD.
- 2) To assess if there is a difference in the type (e.g. partner violence vs past childhood trauma) and severity of exposure to traumatic and stressful life events in alcohol abusing/dependent women with and without PTSD.
- 3) To assess the relationship of co-morbid PTSD to drinking outcomes in women with alcohol use disorder who enter into case management.
- 4) To assess psychiatric diagnostic differences between women who have a child with FASD (Fetal Alcohol Syndrome Disorder) and women who do not.

These objectives were investigated in terms of the following:

*Hypothesis 1:* Rates of PTSD will be higher in women with alcohol abuse or dependence compared to those without.

*Hypothesis 2:* The severity and course of alcohol abuse/dependence will be negatively influenced by the presence and severity of PTSD symptoms and other co-morbidity (e.g. depression).

*Hypothesis 3:* In women with lifetime PTSD, the development of an alcohol use disorder is more likely to be secondary to the onset of PTSD.

*Hypothesis 4:* Women with alcohol abuse/dependence and PTSD are more likely to endorse histories of partner violence, early life trauma, and everyday stressful life events, relative to alcohol abusing/dependent women without PTSD.

*Hypothesis 5:* Women with alcohol use disorders and PTSD who enter into case management will have worse drinking outcomes than those without PTSD.

The results of these objectives and hypotheses will now be discussed.

## **7.2 Demographic information**

The demographic information was gathered through the maternal questionnaire, case management questionnaire, and community survey. The women in the FAS group were on average 2 years older than the women in the No FAS group. Significantly more women in the FAS group were farm workers compared to the No FAS group. The total income of the No FAS group was almost double that of the

FAS group. The No FAS group was significantly more religious than the FAS group. Cohabiting during the pregnancy of child of interest was more common among the FAS group than the No FAS group. The women in the FAS group had a higher rate of unplanned pregnancy with the child of interest than the women in the No FAS group. More women in the FAS group had a child placed in foster care than the women in the No FAS group. Significantly more women in the No FAS group are currently married compared to the FAS group.

### **7. 3. Alcohol dependence/abuse and PTSD**

In terms of Hypothesis 1, it was expected that PTSD would be more prevalent in women with a diagnosis of alcohol abuse/dependence compared to those without an AUD. This hypothesis was examined by means of the CAGE, AUDIT, PTSD and alcohol disorder modules of the MINI and the DTS. The rate of PTSD was significantly higher amongst women with a diagnosis of alcohol abuse and alcohol dependence, which concurs with a study by Kaminer et al. (2008). Studies by Jewkes et al. (2002), Wong et al. (2008), Dunkle et al. (2004) and Brown and Stewart (2008) also support these findings. Previous studies have reported that in treatment-seeking patients with alcohol use disorders, over 80% met criteria for one PTSD symptom cluster. Trauma should, therefore, be addressed in patients with an AUD, even though the full criteria for PTSD might not be met (Norman et al., 2007). It should be noted that even when the full criteria for PTSD are not met, individuals can have functional impairment similar to that seen in individuals with full PTSD (Arnow, 2004). This is in line with a study by Schumacher et al. (2006) which found individuals with high rates of alcohol abuse do have a higher

prevalence of PTSD and a poorer outcome on alcohol abuse treatment when their PTSD is left untreated (Schumacher et al., 2006).

#### **7. 4. The impact of PTSD symptoms and other psychopathology on the severity and course of alcohol dependence**

It was hypothesised that PTSD symptoms and other psychopathologies would be associated with more severe alcohol dependence. The DTS, PTSD and alcohol disorders module of the MINI, AUDIT, Depression modules of the MINI, and SSCL 51 were used to test this hypothesis. According to the MINI significantly more women with a diagnosis of alcohol abuse had a diagnosis of MDD (current, recurrent and with melancholic features). These findings are supported by the literature which reports that women are more likely to abuse alcohol when they are depressed (Helzer & Pryzbeck, 1988; Kocsis, Markowitz & Prien, 1990; Brown & Stewart, 2008; Parker et al., 2010).

More women with a diagnosis of alcohol dependence had a diagnosis of PTSD with a significant difference. A positive correlation was found between the AUDIT and SSCL 51.

In a study by Hasin et al. (2008) it was found that the more severe the alcohol dependence, the more severe other associated disorders are. Previous studies found alcohol abuse and dependence to be co-morbid with other mental health disorders (Beckman, 1994; Bassuk et al., 1998; Grant et al., 2004; Dawson et al, 2005).

The results indicate that the severity of alcohol abuse/dependence is negatively influenced by the presence and severity of depressive symptoms and psychological distress.

### **7. 5 PTSD and the secondary onset of alcohol use disorder**

In women with lifetime PTSD, it was expected that the development of an AUD would be secondary. This hypothesis was tested with the Davidson Trauma Scale and the PTSD module of the MINI to assess for the occurrence of PTSD. The CAGE, AUDIT and alcohol abuse/dependence module of the MINI was used to determine alcohol abuse/dependence. The mean age that women with an alcohol use disorder and a diagnosis of PTSD started drinking alcohol regularly was 19.42 (SD=3.8) and the mean age that women with an AUD without a diagnosis of PTSD started drinking alcohol regularly was 17.81 (SD=2.6), with a significant difference.

Studies by Breslau et al. (2003) and Kvigne et al. (2003) also found a link between trauma exposure and alcohol abuse. Individuals with PTSD use alcohol and/or drugs out of a belief that the distressing effects of the PTSD symptoms will be relieved by these substances, in accordance with the self-medication hypothesis (Chilcoat & Breslau, 1998). Women initially drink alcohol to escape the PTSD symptoms, but often find the withdrawal symptoms associated with alcohol dependence intolerable, which causes more drinking and relapses to once again escape the arousal symptoms (van der Kolk et al, 1985).

Indirect results suggest that in women with an AUD in whom a diagnosis of PTSD is also present, initiation of regular drinking occurs later in adulthood. It is possible that the initiation of drinking may have occurred after the onset of PTSD, although other contributory factors for a later age of drinking cannot be ruled out.

#### **7. 6 Alcohol use disorders, PTSD and histories of partner violence, early life trauma, and everyday stressful life events**

It was expected that women with an AUD and a diagnosis of PTSD will have more severe histories of partner violence, early life trauma, and everyday stressful life events than those without a diagnosis of PTSD. The AUDIT, PTSD modules of the MINI, CTQ, questions about current stressors, and a Partner Violence Questionnaire were used to test this hypothesis. There were significantly more women with an AUD (alcohol/abuse and dependence) and PTSD endorsed histories of intimate partner violence compared to women with an alcohol use disorder without PTSD. Significant differences were found on the following forms of intimate partner violence: kicked, dragged or beaten, choked or burned, threatened with a weapon, physically forced to have sex, and sex out of fear. These results concur with another South African study by Marais et al. (1999) that found higher rates of PTSD and MDD in women with histories of domestic violence, and also studies by Duncan et al. (1996) and Covington & Kohen (1984). Women with an AUD and PTSD had an average score of 49 (low to moderate trauma) on

the CTQ. Women with an AUD without PTSD had an average score of 53 (low to moderate trauma) on the CTQ.

More than half of all women in the maternal study presented with histories of childhood trauma.

Questions about current stressors revealed the following about everyday stressful life events: women with an AUD and PTSD experienced more stress with regard to alcohol or substance abuse, marital and relationship problems, problems with children/family, unemployment and financial problems – with a statistically significant difference. Stress relating to neighbourhood problems, health issues, gossip and a small living space, were higher in women with an alcohol use disorder without PTSD – although not statistically significant. Women with an AUD and PTSD thus have higher rates of intimate partner violence and everyday stressful live events but not early childhood trauma.

### **7. 7 Alcohol use disorders co-morbid with PTSD and drinking outcomes**

Women with an AUD and PTSD were expected to have worse drinking outcomes than those without a diagnosis of PTSD. The Davidson Trauma Scale and the PTSD module of the MINI were used to diagnose PTSD. The AUDIT was administered at intake, 6, 12 and 18 months follow-up to determine if there was a difference in drinking outcomes between women with and without PTSD. Women with PTSD had higher AUDIT scores at intake, 6 months follow-up and 12 months follow-up, but lower at 18 months follow-up, compared to women without PTSD. Women with PTSD, therefore, appear to have a more unfavourable drinking course than women without PTSD. However, the hypothesis that women with PTSD would have worse drinking outcomes (Schumacher et al., 2006) at 6 months

follow-up and at 12 months follow-up could not be evaluated given the small sample of women evaluated in case management, and in particular the finding that only two women met criteria for PTSD. As such the sample did not provide adequate power to detect group differences. . May et al. (2007) also recommended case management in a rural community in South Africa with high risk women.

### **7.8. Psychiatric diagnostic differences between women who have a child with FASD (Fetal Alcohol Syndrome Disorder) and women who do not**

According to the MINI, more women with a child diagnosed with FAS had a diagnosis of MDE recurrent and MDD with melancholic features. The duration that the depressive episode lasted for the women with a FAS child was significantly longer than with the women without a child diagnosed with FAS. Other studies have had similar findings (Dawson et al., 2005; Stratton et al., 1996). Consistent with this, more women in the FAS group reported that they had feelings of anger and sadness. The rate of alcohol abuse, alcohol dependence and PTSD were higher in the FAS group, compared to the No FAS group. More women with a child diagnosed with FAS were victims of intimate partner violence, with the frequency and the severity of the abuse being higher than in the No FAS group. Childhood trauma affected more women with a child diagnosed with FAS – with emotional abuse, emotional neglect, sexual abuse, physical abuse and physical neglect being higher than in the No FAS group. However, in both the FAS and the No FAS groups the mean for childhood trauma indicates moderate to severe

childhood trauma. Women in the FAS group reported that their lives were more stressful when pregnant with the FAS child, than women in the No FAS group. The women in the FAS group also reported having more stressful lives and were facing more life challenges currently. This is supported by findings in a previous study by May et al. (2000) and York and Horvarth (2008).

### **7.9. Limitations of the study**

The following can be considered to be limitations of the study:

- 1) All the respondents were from the same province in South-Africa. It can thus not be assumed that the findings would be valid for other provinces.
- 2) The sample of women in case management were relatively small (N=50), and this could have a possible effect on the statistical validity of the study.
- 3) Reporting on the Childhood Trauma Questionnaire was retrospective, and recall bias might exist.
- 4) The possibility of under-reporting or over-reporting with some of the instruments or questions must be considered.
- 5) Although the questionnaires were in Afrikaans, which is the first language of most of the respondents, illiteracy is also prevalent amongst the women and might have influenced the respondents' understanding of, or response to, a question.
- 6) Most of the instruments were self-report, and this could have led to over-reporting or under-reporting of symptoms.



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90

## CHAPTER 8

### CONCLUSION AND RECOMMENDATIONS FOR PRACTICE AND RESEARCH

The study aimed to investigate PTSD, trauma and other psychopathologies in women with and without a child diagnosed with FAS in a rural community sample.

#### 8.1 Conclusion

- Women with alcohol abuse/dependence have higher rates of PTSD compared to women without alcohol abuse/dependence.
- The severity of alcohol abuse/dependence was negatively influenced by the presence and severity of depressive symptoms and psychological distress.
- Indirect evidence suggested that the development of an alcohol use disorder is secondary to the onset of PTSD in women with lifetime PTSD.
- Women with alcohol abuse/dependence and PTSD are more likely to endorse histories of partner violence and everyday stressful life events relative to alcohol abuse/dependent women without PTSD. Early life trauma was high in both groups. Women with intimate partner violence had higher rates of PTSD, depression and alcohol abuse/dependence.

- The small group in case management is a major limitation and further studies are necessary to ascertain whether case management is an effective approach to manage PTSD and alcohol abuse/dependence in women in a rural community.
- Women with a FAS child had higher rates of depression, alcohol use disorders, PTSD, intimate partner violence and childhood trauma compared to those without a FAS child.

## **8.2 Recommendations for the practice**

The high prevalence of intimate partner violence in the study population is concerning and health care professionals could play an important role in educating and counseling these women about their rights, options etc. Time permitting, all women should be screened for depression, as such a high rate of depression is prevalent in the community. Rates of PTSD should still be explored as many of the women were exposed to traumatic events, have stressful lives and reported PTSD symptoms. In light of the high alcohol dependence rate in the study communities, it is recommended that all women of child-bearing age be educated about the dangers and symptoms of Fetal Alcohol Syndrome. The possible co-occurrence of alcohol dependence and other psychopathologies should also be considered. Early intervention of children exposed to trauma can possibly prevent development of psychiatric problems, including alcohol use disorders later in life. Traumatized children should receive early intervention to prevent later onset of alcohol abuse and possible birth of a FAS child. Women who experience trauma, depression and intimate partner violence also need intervention, to prevent later development of alcohol

abuse/dependence. Women that have a child with FAS should be screened for depression, PTSD, intimate partner violence and early childhood trauma.

It is further recommended that the specific challenges and stressful life events that the women in these communities live with, must be kept in mind when choosing a therapy model. Other departments, for instance, Department of Social Development could also play an important role in the prevention and treatment of alcohol dependence and intimate partner violence. Non-governmental Organizations (NGO's) could also become involved in combatting the challenges in the communities.

### **8.3 Recommendations for future studies**

It is recommended that similar research is conducted in other provinces to ascertain if the same rates of alcohol abuse/dependence, partner violence, PTSD and depression are prevalent amongst women in these communities. Resilience in the women in the communities should also be explored as it can give a better understanding of culture- specific psychological strengths that could be used in therapy and treatment. The efficacy of case management as treatment of choice in the management of psychological problems in the rural communities should be further explored. The results indicate that more research is required regarding the effectiveness of case management for women with PTSD and alcohol dependence. This study focused on women in a rural community sample in the Western Cape Province. More research is needed to determine the prevalence of FAS in other rural communities as well as the prevalence of depression, trauma, PTSD, early childhood trauma and intimate partner violence in

women that have a child with FAS. More research is also needed in more affluent areas to determine the rates of FAS and to establish the demeanor of the women in these communities, specifically focusing on depression, PTSD, early life trauma and intimate partner violence.

**Table 18: OVERVIEW: Conceptual Scheme and Time Sequence of Major Community Research Variables Years 1-5: A Trial of FAS Prevention in a South African Community**

(T <sub>1</sub> ) Pre-Programme Conditions Assessed (0- 9 months)	(T <sub>1</sub> ) Pre-Programme Conditions Assessed (10- 50 months)	(T <sub>1</sub> ) Pre-Programme Conditions Assessed (51- 60 months)
<p><u>Baseline Measures</u> <u>Established/Reviewed:</u> X FAS prevalence in control site X Status of mothers producing FAS:</p> <ol style="list-style-type: none"> <li>a. Variability, Quantity, and Frequency of drinking; peak BAC</li> <li>b. Birth control status</li> <li>c. Family/Living status (e.g., drinking spouse)</li> <li>d. Multiple social and demographic indicators</li> <li>e. Nutrition</li> <li>f. Physical measures of mother</li> </ol> <p>X Adult (+16 yrs.) drinking prevalence for above measures for entire adult population (men &amp; women)</p> <p>X Community Readiness for Change Survey initiated (Oetting, et al., 1995)</p> <p>X Proximate FAS and abusive drinking indicators in community survey</p> <ol style="list-style-type: none"> <li>a. Knowledge, Attitudes and Beliefs, and Behaviour (KABB)</li> <li>b. Women's and men's opinions, norms, and expectancies</li> <li>c. Alcohol-related problems               <ol style="list-style-type: none"> <li>1. Mortality</li> <li>2. Morbidity</li> <li>3. Crime</li> </ol> </li> </ol> <p>X Process measures to link programme activity and participation established</p>	<p><u>Prevention Communities:</u> Indicated Strategies Selective Strategies Universal Strategies</p> <ol style="list-style-type: none"> <li>X Continuing screening of FAS suspects as infants</li> <li>X Continuing interviews of maternal risk factors</li> <li>X Process measures collected (exposure and magnitude of solution)               <ol style="list-style-type: none"> <li>a. Number of participants in lectures, school curricula, public meetings, and other activities</li> <li>b. Materials distributed: where and to whom</li> <li>c. Knowledge gain and retention by various groups, e.g., health providers, citizens</li> <li>d. Nature of public policy and alcohol prevention activities</li> </ol> </li> <li>X Process measures to link programme activity and participation established               <ol style="list-style-type: none"> <li>a. Magnitude</li> <li>b. Intensity</li> <li>c. Quality</li> <li>d. Implemented pre-prevention or initial community-wide survey</li> </ol> </li> <li>X Monitor baseline FAS prevalence in both sites via</li> </ol>	<p>Outcome Assessed:</p> <ul style="list-style-type: none"> <li>· Age-specific FAS prevalence from births and in-school surveys.</li> <li>· Documented status of FAS mothers and others at risk for heavy drinking contacted by previous programme               <ol style="list-style-type: none"> <li>a. QFV of drinking (abstinence-heavy drinking) binges and peak BAC after CM.</li> <li>b. Birth control adaptation and use after intervention</li> <li>c. Family/Living status</li> <li>d. Multiple social and demographic indicators post intervention</li> </ol> </li> <li>· Adult drinking prevalence reassessed (especially in women 15-44) in 3rd community survey</li> <li>· Change in proximate FAS and abusive drinking indicators examined in 2nd community survey               <ol style="list-style-type: none"> <li>a. Changes in KABB condoning of problem drinking during pregnancy and overall</li> <li>b. Changes in norms, opinions, and alcohol expectancies</li> <li>c. Alcohol-related problems change (from community</li> </ol> </li> </ul>

<p>a. Magnitude  b. Intensity  c. Quality  d. Implemented pre-prevention or initial community-wide survey  X Monitor in-school FAS prevalence in both sites.  X Monitor births for FAS prevalence in both sites.</p>	<p>in-school studies.  X Adult drinking survey - 2<sup>nd</sup> wave.  X Prenatal nutrition study (assays from 100 heavily drinking women and 200 controls).</p> <p><u>Comparative Communities</u>  No specific prevention activities carried out by Programme Staff -  - research only on FAS prevalence and maternal risks, with the exception of standard public health and education materials for prevention as provided by the SA government.</p>	<p>surveys)  1. Mortality  2. Morbidity  3. Crime  · Process measures of programme activities linked to outcome  a. Individual participation and exposure levels linked to protective beliefs and behaviours from items on community-wide survey  b. Overall level of community activity and exposure linked to magnitude of change  ·X Community Readiness for Change Survey repeated</p>
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**Table19: Specific Prevention Tasks by Time Sequence for a Trial of FAS Prevention in South Africa**

Time 1 (0-9 months)	Time 2 (10-50 months)	Time 3 (50-60 months)
<p><b>PREVENTION SITE</b></p> <ol style="list-style-type: none"> <li>Hire prevention specialists and on-site staff</li> <li>Begin and complete all prevention training (public health measures, MI, CRA, prevention techniques)</li> <li>Set up prevention offices, collaboration network, agreements, and contracts.</li> <li>Adult prevalence survey and completed analysis of some extant maternal risk factor surveys done to fine tune prevention strategies</li> <li>Begin all levels of prevention activity</li> </ol> <p><b>CONTROL SITE</b></p> <ol style="list-style-type: none"> <li>Hire &amp; train research coordinators (UCT&amp;UNM) <ol style="list-style-type: none"> <li>Set-up offices</li> </ol> </li> </ol> <p><b>BOTH SITES</b></p> <ol style="list-style-type: none"> <li>Finalise all cooperative agreements with agencies and schools</li> <li>Finalise questionnaire, screening materials, and procedures with local sties</li> <li>Adult prevalence, epidemiology of substance abuse, and KABB random survey sample chosen (16+ yrs.), contacted, and interviewed: <ol style="list-style-type: none"> <li>Baseline prevalence of drinking</li> <li>Delineate risk factors for women and men of childbearing age</li> <li>Baseline KABB and norms</li> <li>Use survey data to implement specific prevention approaches</li> </ol> </li> <li>Begin to screen major anomalies in 1st grade classes and in hospitals with newborns : <ol style="list-style-type: none"> <li>To establish baseline</li> </ol> </li> </ol>	<p><b>PREVENTION SITE</b></p> <ol style="list-style-type: none"> <li>Implementation of strategies based on research results of T1 survey and T2 experience</li> <li>Continue to Implement prevention as indicated in scientific literature (see May, 1995b): <ol style="list-style-type: none"> <li><u>Indicated:</u> <ol style="list-style-type: none"> <li>Active case identification network established in general medicine , obstetric, prenatal, emergency clinics; alcoholism programmes; criminal justice; social service agencies; high risk settings</li> <li>Aggressive but empathic CM of women w/FAS child and still at risk; assess personal characteristics including readiness to change.</li> <li>Institute motivational interviewing, Drinker's Check-up in programme offices</li> <li>Make referrals for special care for highest risk individuals for: alcohol therapy; family services, birth control services, and nutritional therapy</li> <li>Provide pre-natal vitamins for pregnant women</li> <li>Set up support groups for highest risk women</li> </ol> </li> <li><u>Selective:</u> <ol style="list-style-type: none"> <li>Institute/monitor routine use of screening tool (SAQ) for identifying high risk drinkers and families in clinics</li> <li>Empathic CM (brief) for women of moderate risk</li> <li>Initiate/coordinate referrals as appropriate to other agencies</li> <li>Continue/develop support groups for women (and their spouses) who are in early stages of abusive or heavy drinking</li> <li>Heighten community awareness of signs of problem drinking and provide specific strategies of individual/group solutions by encouraging broader-based screening.</li> </ol> </li> <li><u>Universal:</u> <ol style="list-style-type: none"> <li>Continue to assess/monitor motivation level in community</li> <li>Educate on prevention of FAS: <ol style="list-style-type: none"> <li>Community wide</li> <li>School teachers and</li> </ol> </li> </ol> </li> </ol> </li> </ol>	<p><b>PREVENTION SITE</b></p> <ol style="list-style-type: none"> <li>All CM winds down in 5th year and women's' lives and services stabilized</li> <li>Other prevention levels window</li> <li>Focus on post-prevention research</li> </ol> <p><b>BOTH SITES</b></p> <ol style="list-style-type: none"> <li>Adult drinking and KABB survey repeated using exact same criteria, methods, and questionnaire items plus explicit measures of experience with prevention programme interventions (exposure)</li> <li>Final screening for both sites completed and prevalence figures finalized for children (born 2004-2009). Some recent births may be diagnosed as probable, pending longitudinal monitoring of growth and development</li> <li>Measures of prevalence (drinking and FAS) and risk-factor assessment (maternal and social) will be summarized for prevention and future prevention application</li> <li>Multivariate analyses (including multiple correlation studies) finalised to identify the most important determinants of prevention success in these communities <ol style="list-style-type: none"> <li>Maternal risk factors</li> <li>Social/cultural risk factors</li> <li>Child development issues</li> </ol> </li> <li>Finalize all proxy measures of prevention-induced change and epidemiological importance:</li> </ol>

<p>prevalence of FAS</p> <p>b. To provide children with education plans</p> <p>c. Elicit particular risk factors</p> <p>d. Feedback of results to prevention</p> <p>5. Delineate other proxy measures of FAS, exposure and risk in the target and control communities</p> <p>a. Mortality measures indicating alcohol abuse problems</p> <p>b. Morbidity patterns and data</p> <p>c. Patterns of alcohol abuse</p> <p>d. Data presented to social welfare, criminal justice and other institutions.</p>	<p>pupils</p> <p>c) Other community leaders</p> <p>3) Educate and demystify alcohol and drinking behaviour in general with an emphasis on correcting misperceptions of drinking norms</p> <p>4) Educate, advocate, and coordinate discussions, planning, and strategies for reduction and prevention of maternal alcohol abuse.</p> <p>5) Advocate for broad community-based strategies of care for FAS children (e.g. parent groups, half-way houses)</p> <p>3. Continuous collection and analysis of data:</p> <p>a. Continuous screening of FAS suspects born</p> <p>b. Maternal interviews</p> <p>c. Proxy measures of FAS issues</p> <p>4. Formative evaluation (process) data collected routinely</p> <p>5. High risk traits of local women defined further</p> <p style="text-align: center;"><b>CONTROL SITE</b></p> <p>1. Continuous screening of all FAS suspects in target cohorts (schools &amp; newborns) and provide treatment recommendations where appropriate</p> <p>2. Return FAS results to community officials/leaders</p> <p>3. Return first two adult prevalence of drinking survey results to officials</p> <p>4. No other interventions at control site</p>	<p>a. Drinking</p> <p>Behaviour</p> <p>b. KABB and norms</p> <p>c. Mortality</p> <p>d. Morbidity</p> <p>e. Social Welfare/Criminal Justice</p> <p>6. Plan for continuation and institutionalisation of prevention programmes after grant termination (including personnel)</p> <p>7. Help control site establish their own programme</p> <p>8. Seek other avenues for funding of FAS prevention at both sites</p> <p>9. Advocate for FAS prevention throughout communities where needed.</p>
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Tables 18 and 19 adapted from “FAS Prevention in South Africa: A Trial of the IOM Model.