



Review article

PTSD among road traffic accident survivors in africa: A systematic review and meta-analysis

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ABSTRACT

Introduction: Road traffic accidents (RTA) could have severe and lifelong physical and psychological consequences. Post-Traumatic Stress Disorder (PTSD) is a major psychiatric disorder after exposure to a traumatic event such as RTA. This systematic review and meta-analysis has reviewed previous studies conducted on the topic, summarized the prevalence and determinants of PTSD among RTA survivors in Africa, and forwarded recommendations.

Method: Using the PRISMA guideline as a framework, we systematically reviewed and meta-analysed studies examining the prevalence and determinants of PTSD among RTA survivors in Africa. PubMed, PsychINFO and CINAHL databases were searched to retrieve published articles on the topic. We have used visual inspection of the funnel plot and Egger's regression test to examine publication bias. All the data were analysed using STATA.

Result: We have included 11 studies conducted in African countries containing 7078 study participants. In this meta-analysis, the pooled prevalence of PTSD among RTA survivors was 26% (95% CI: 17.0–35.0). The pooled prevalence of PTSD ranged from 22.2–27.3% in a leave-one-out sensitivity analysis. Further, subgroup analysis found that the pooled prevalence of PTSD among RTA survivors was higher in the studies that used screening tools, 30% (95% CI: 14–46.0) compared to those that used the diagnostic tools, 23% (95% CI: 12–34).

Conclusion: Our review found that around one in four RTA survivors in Africa suffers from PTSD. Screening and appropriate management of PTSD for RTA survivors are warranted to alleviate suffering. Moreover, RTA survivors who got presumptive screening tests positive for PTSD should be linked to the psychiatry clinic.

1. Introduction

According to the DSM-IV criteria, Post-traumatic stress disorder (PTSD) can be diagnosed when an individual lives through or witnesses a traumatic event. As a result of a traumatic event, “a person should have re-experiencing symptoms (e.g. intrusive memories, nightmares), avoidance (e.g. avoiding reminders of the trauma), and hyperarousal (e.g. insomnia, startle response) which last for at least one month, and cause significant occupational or social impairment” [1]. PTSD occurs after exposure to traumas such as actual or threatened death, severe injury, or sexual violence, manifested by persistent, involuntary, and intrusive recollection of the traumatic event. A traumatic event can aggravate fear, helplessness, or horror in reaction to the threat of injury or death [2].

Road traffic accidents (RTA) result in severe and long-term physical and psychological consequences for victims [3, 4]. Global mortality and burden of disease projections in 2006 estimated that RTA will rank 7th place as a burden of disease in low-income countries, including those in Africa, by 2030 [5,6]. Globally, PTSD is recognized as the most frequently occurring psychiatric problem in the repercussion of traumatic exposure such as RTA [7]. This disorder may affect any individual in any age group exposed to one or more life-threatening events [8].

Several epidemiological studies have found a varied prevalence of PTSD among RTA survivors. For example, the prevalence was 41% in California [9], 36.6% in Serbia [10], 19.2% in Iran [11], 19.6% in South Africa [12], 26.7% in Nigeria [13] and 13.3% in Kenya [14]. Nevertheless, in the general population, the lifetime prevalence of PTSD ranged from 0.56 to 6.67% and 8% in Europe and US, respectively [15].

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Factors significantly associated with the odds of experiencing PTSD include genetic endowment and being female [9]. Previous trauma exposure, history of mental illness, low income, comorbid psychiatric disorder, perceived threat to life, poor social support, losing a job, and chronic physical problems following the accident were also significant correlates of PTSD among RTA survivors [9, 16, 17, 18, 19, 20].

If left untreated, PTSD can have serious and long-lasting results such as occupational impairments and decreased health-related quality of life [20, 21], irritable bowel syndrome and poor physical health [22]. It also affects the problem-solving, planning and abstract reasoning abilities of RTA survivors [23]. Moreover, it is linked with substantial comorbidities, such as depressive disorder and substance use [8]. Therefore, screening RTA survivors for PTSD symptoms at a health facility can help early prevention of Chronic PTSD and its adverse consequences [24].

Evidence has shown that improved awareness of determinants and pooled prevalence of PTSD among RTA survivors could help health care professionals and policymakers in planning and implementing effective screening and management strategies for PTSD [14]. However, per our knowledge, no previous systematic review and meta-analysis looked at the epidemiology of PTSD among RTA survivors in Africa. Also, the relationship between PTSD and socioeconomic factors supports the need

for this review. Thus, in response to this research gap, this systematic review and meta-analysis intended to pool the prevalence of PTSD and narrate its determinants among RTA survivors in Africa using the existing data.

2. Methods

2.1. Design

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework was used to perform this review [25] (Supplementary file 1). This review's protocol was registered in PROSPERO (CRD42022296048). To find relevant studies, CINAHL, PubMed, and PsychINFO databases were extensively searched. The following keywords were used in a PubMed search: #1(Prevalence OR Proportion OR Magnitude OR Epidemiology OR Incidence OR Burden OR Estimates OR Determinants OR Associated factors OR Risk factors OR Predictors OR correlates) AND #2(PTSD OR Post-traumatic stress disorder OR Post-traumatic stress symptoms OR Stress disorder) AND #3 (Road Traffic Accident survivors OR Road traffic accident victims OR Road Traffic Accident sufferers OR motor vehicle accident OR motor vehicle

PRISMA Flow Diagram

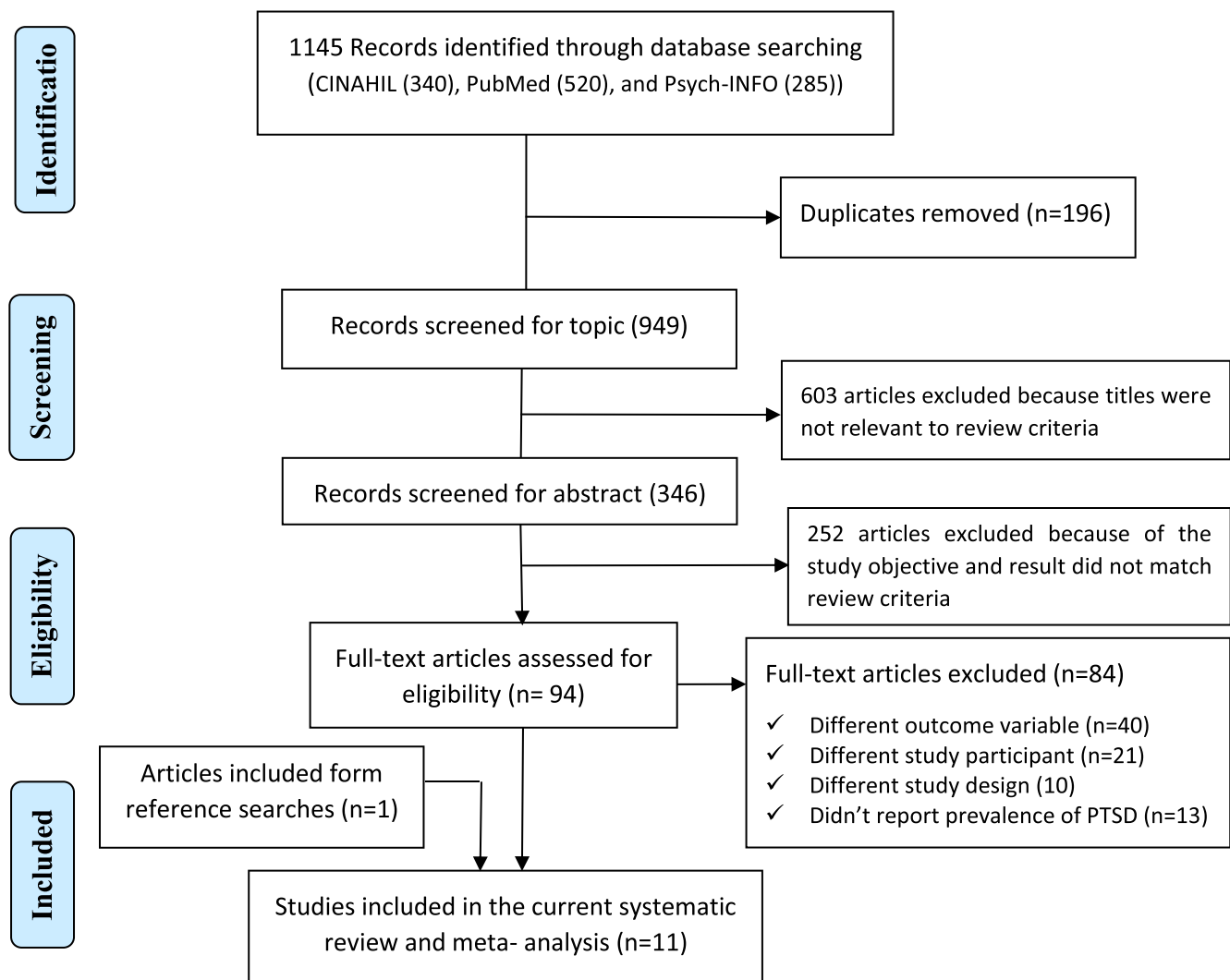


Figure 1. PRISMA flowchart of review search on the prevalence and determinants of PTSD among RTA survivors in Africa.

accidents'). CINAHL and PsychINFO databases were also searched using subject headings linked with the above terms. In order to find additional potentially pertinent publications for this review, we also looked through the reference lists of eligible studies. The databases' search parameters include English-language literature and the time frame from October 1, 2000, to August 30, 2020. We assessed the retrieved papers' titles, abstracts, full-text contents, and duplication against the listed eligibility criteria. The full search strategy is accessible in Supplementary file 2.

2.2. Eligibility criteria

Studies meeting the following criteria were part the current review. First, the study type must be observational (cross-sectional, case-control, or cohort) and intervention studies if they report prevalence of PTSD. Second, study participants should have survived RTA, and the study must report an instrument used to diagnose or screen for PTSD. Duplicates, review papers, conference abstracts and articles not published in English were excluded. AB and NM undertook the initial search and study selection. Further, AB and BD looked at the eligibility of full-text articles. Differences between authors were resolved through discussion.

2.3. Quality appraisal and data extraction

The quality appraisal of studies included was conducted using the revised Newcastle-Ottawa Scale (NOS) [26]. The Summary of bias and level of agreement between evaluators of articles is stated in Supplementary file 3. Data extraction was done independently by two authors (AB, NM) and disagreement was resolved through discussion. We have used a pre-specified form to extract data. We extracted necessary data from each study as recommended by PRISMA [25].

2.4. Data synthesis

STATA was used to conduct all the analyses. Because of substantial heterogeneity a random-effect meta-analysis was used to pool the prevalence of PTSD [27]. We have used Q and I² statistics to determine the level of heterogeneity across studies [27]. Subgroup analysis was conducted to evaluate the prevalence across different groups. We ran sensitivity analysis to distinguish the effect of a single study on the pooled estimate. Also, to identify the possible sources of heterogeneity, we performed a univariate meta-regression analysis. Publication bias was

assessed by inspection of the funnel plot and using Egger's regression tests. Narrative analysis was used to briefly describe the significant determinants of PTSD among RTA survivors.

3. Results

3.1. Study identification

Initially, our database literature search identified 1145 articles. From these, 1051 were removed while screening (i.e., duplicates (n = 196), 603 articles were excluded after the title review because of not relevant to reviewed criteria, and 252 articles were excluded after the abstract review because the study objectives and results did not match review criteria). Moreover, a full-text of 94 studies were identified for full-text assessment, and 84 of these papers were banned because of not fulfilling the eligibility criteria. Also, an additional 1 article was included from reference searches. Finally, a total of 11 full-text articles were involved in the review (Figure 1).

3.2. Characteristics of included studies

A total of 11 studies conducted in African countries, including 7078 study participants, were included in the current review. Among the included 11 studies, four were from Ethiopia, one from Kenya, and three studies each from Nigeria and South Africa. Regarding the study design of the included studies, one was a prospective cohort study; two were case-control studies, and studies were cross-sectional studies. PTSD was assessed by DSM-IV in four studies and PCL-S used in four studies (Table 1).

3.3. Study quality appraisal

Newcastle Ottawa Scale (NOS) was used to evaluate the quality of the studies. All the studies involved in this review have good quality (NOS score ≥7) (Supplementary file 4).

3.4. Meta-analysis

The pooled prevalence of PTSD among RTA survivors was 26% (95% CI; 18–35). Due to apparent heterogeneity across the studies, we have

Table 1. Characteristics of included studies in the systematic review and meta-analysis on PTSD among RTA survivors in Africa.

First Author (Year)	Study design	Sample Size	Tool	Response Rate	Country	Participants	Time point at which PTSD assessed	Prevalence	Quality score
Ongecha-Owuor, 2004 [14]	Cross-sectional	264	DSM IV	100%	Kenya	Passenger, Driver and Pedestrian	After 1 month	13.3%	7
Ajibade 2015 [28]	Cross-sectional	400	PCL-S	100%	Nigeria	Passenger, Driver and Pedestrian	After 1 month	51.8%	8
Yohannes 2018 [29]	Cross-sectional	531	PCL-S	92.65%	Ethiopia	Passengers and Drivers	After 1 month	22.8%	9
Iteke 2011 [13]	Case control	150	DSM IV	150	Nigeria	Passenger, Driver and Pedestrian	NA	26.7%	8
Fekadu 2019 [30]	Longitudinal	299	PCL-S	100%	Ethiopia	Passengers and Driver	Within 1 month	46.55%	9
Lukoye 2013 [31]	Cross-sectional	4315	DSM IV	85%	South Africa	Passenger, Driver and Pedestrian	Within 12 month	17%	8
Asuqoye 2017 [32]	Case control	92	DSM IV	100%	Nigeria	Passenger, Driver and Pedestrian	NA	41.3%	8
Stein 2016 [33]	Cross-sectional	52	DSM IV	100%	South Africa	Motor bike rider, a pedestrian, cyclist, and bystander	NA	5.6%	7
Bedaso 2020 [34]	Cross-sectional	423	PCL-S	98.60%	Ethiopia	Passengers and Driver	Within 6 month	15.4%	8
Alenko 2019 [35]	Cross-sectional	402	TSQ	99%	Ethiopia	Drivers	After 1 month	12.6%	9
Dickov 2009 [10]	Cross-sectional	150	ICD-10	100%	South Africa	Passengers and Driver	NA	36%	8

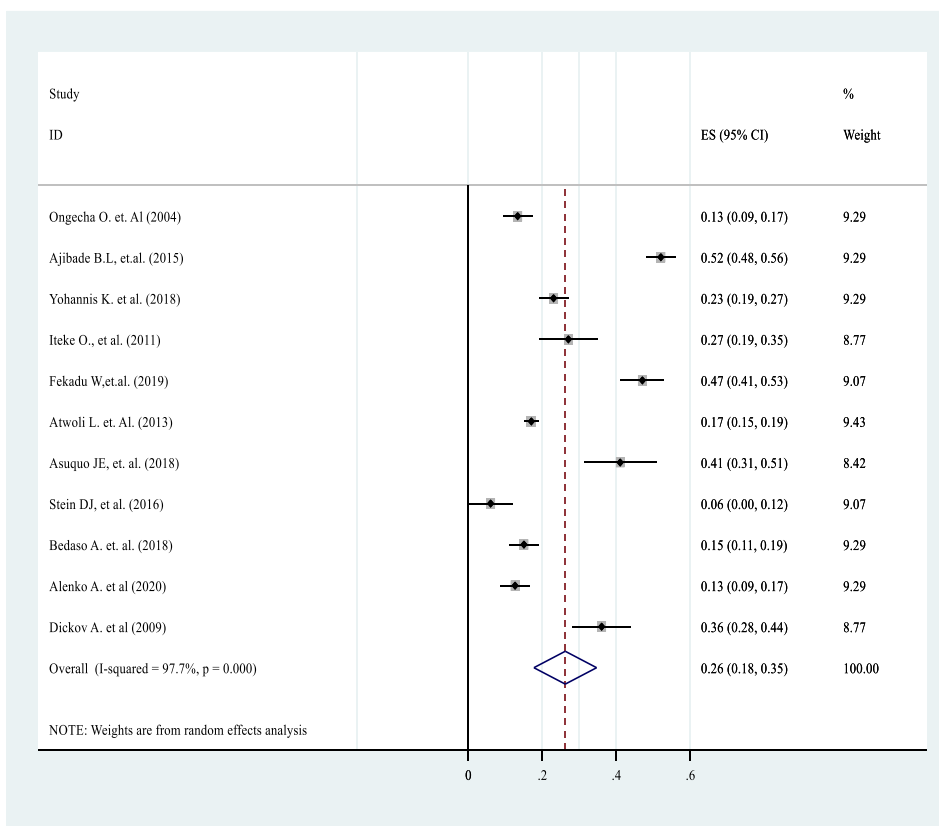


Figure 2. Forest plot of the pooled prevalence of PTSD among RTA survivors in Africa: a systematic review and meta-analysis.

used a random effect model while conducting a meta-analysis ($I^2 = 97.7\%$, $Q\text{-value} = 429.53$, $df = 10$, $p < 0.001$) (Figure 2).

In order to ascertain the sources of heterogeneity, we performed univariate meta-regression using publication year, country of origin, measurement tool, quality of study, and study design as covariates. However, except for the country of origin, none of the variables significantly explained the source of heterogeneity (Table 2). The univariate meta-regression indicated the studies conducted in Nigeria ($\beta = 19.04$ (1.19, 36.89), $p = 0.036$) could be the source of heterogeneity in the pooled estimate where the highest pooled prevalence (40%) reported compared to other countries.

3.5. Subgroup analysis

The highest prevalence of PTSD among RTA survivors was identified in Nigeria (51.8%) [28], followed by a study conducted in Ethiopia (46.5%) [30]. The lowest prevalence of PTSD among RTA survivors was reported in South Africa (5.6%) [33], followed by a study conducted in Ethiopia (12.6%) [35] and Kenya (13.3%) [14]. We have conducted a subgroup analysis using characteristics including the country where a study was conducted, study design, and the instrument used to assess PTSD.

A higher pooled prevalence of PTSD was found among studies conducted in Nigeria (40%) ($I^2 = 92.33$, $p < 0.001$), followed by studies conducted in Ethiopia (24%) ($I^2 = 98.03\%$, $P < 0.001$). In addition, a higher pooled estimate of PTSD was found in a study that employed a longitudinal design (47%), followed by a case-control studies (34%, 95% CI: 20–47) ($I^2=79.08$, $p < 0.03$) and cross-sectional studies (22%, 95% CI: 11–32) ($I^2 = 98.34\%$, $P < 0.001$).

Also, we have conducted a subgroup analysis using diagnostic (DSM IV and ICD 10) and screening tools (PCL (CV) and TSQ). The pooled prevalence of PTSD among RTA was higher in the studies that used screening tool 30% (95% CI: 14–46) ($I^2 = 98.64$, $p < 0.001$) when

compared to the studies that used the diagnostic tool 23% (95% CI: 12–34) ($I^2 = 96.48$, $p < 0.001$) to assess PTSD (Figure 3).

3.6. Risk of publication bias and sensitivity analysis

In this systematic review, the funnel plot appeared asymmetric, but Egger’s regression tests (at 5% significant level) showed no evidence of potential publication bias ($B = 5.232$, $SE = 4.538$, $P = 0.279$) (Figure 4). Also, a leave-one-out sensitivity analysis demonstrated that the prevalence of PTSD among RTA survivors ranged between 23.6% and 29.4% (Figure 5).

3.7. Narrative analysis

Table 3 presented the extracted significant factors associated with PTSD among RTA survivors in Africa. This section has narrated significant factors associated with increased odds of PTSD among RTA survivors in Africa. Overall, we have observed varying confounder adjustments across the included studies.

Table 2. Factors related with heterogeneity of the prevalence of PTSD among RTA survivors in Africa.

Variables	N	β (95% CI)	P-value
Publication year	11	0.456 (-1.59, 2.51)	0.663
Country of origin			
Ethiopia	4	-2.97 (-22.79, 16.83)	0.769
Kenya	1	-14.08 (-45.98, 17.81)	0.387
Nigeria	3	19.04 (1.19, 36.89)	0.036
South Africa	3	-9.21 (-29.93, 11.50)	0.304
Tools (Diagnostic Vs Screening)	11	-6.69 (-25.43, 12.03)	0.484
Quality of Study (NOS score)	11	7.38 (-6.09, 20.87)	0.283
Study design (Cross-sectional Vs Others)	11	-16.47 (-35.43, 2.49)	0.089

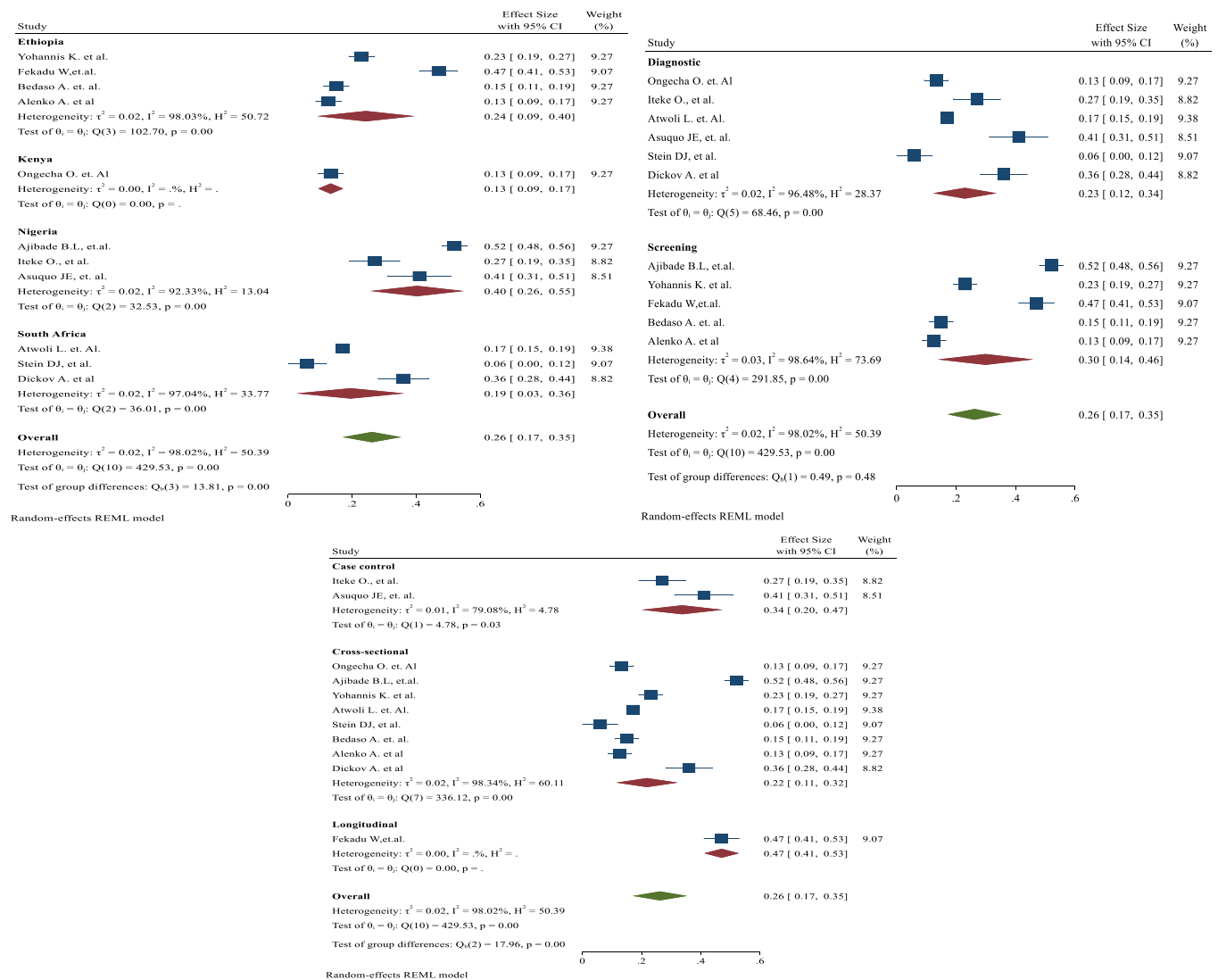


Figure 3. Sub-group analysis on prevalence of post-traumatic stress disorder among RTA survivors in Africa.

We found that depression has a significant association with PTSD based on the reports of three cross-sectional studies conducted in Ethiopia [29, 34, 35]. Two cross-sectional studies conducted in Ethiopia also supported a significant association between PTSD and duration of post-accident (1–3 months) [29, 34].

An institution based study conducted in Addis Ababa, Ethiopia, revealed that being female (AOR: 2.23, 95% CI: 1.40, 3.56) and getting poor social support (AOR: 2.1, 95% CI: 1.34, 3.46) were associated with a higher likelihood of suffering from PTSD. Also, a cross-sectional study conducted in South Africa among 4315 RTA survivors found that having a high-average educational level (AOR: 0.10, 95% CI: 0.01–0.82) was negatively related with 12 month probable PTSD [31].

Further, a study conducted in selected public hospitals in southern Ethiopia among RTA survivors reported that a previous accident (AOR: 2.67, 95% CI (1.23–5.77)) and experiencing a common mental disorder (AOR: 12.78, 95% CI: 5.56–29.36) found to have a significant linkage with PTSD [34]. A prospective cohort study conducted in Bahir Dar town in Ethiopia, among a sample of RTA survivors in the orthopedic unit, has shown that having poor sleep pattern (none to slight) (RR: 0.42, 95% CI: 0.29–0.63), witnessing death during an accident (RR: 1.31, 95% CI: 1.03–1.68) and highly impaired family relationship (RR: 2.18, 95% CI (1.62–2.92)) were significant risk factors for PTSD [30].

Finally, a community-based study conducted in Southwest Ethiopia, among a sample of 402 male drivers who survived road traffic crashes,

showed a history of near-miss road traffic crashes (RTCs) (AOR: 3.49, 95% CI: 1.89–6.43) and severe-risk cannabis use (AOR: 2.51, 95% CI: 1.96–7.52) have a significant moderate positive association with PTSD [35].

4. Discussion

Our review has synthesized 11 studies investigating the prevalence and determinants of PTSD among 7078 RTA survivors in Africa, of which 1840 had been diagnosed/screened positive for PTSD.

In this review, the pooled prevalence of PTSD among RTA survivors was 26% (95% CI: 18–35). The pooled estimate of the current meta-analysis was comparable with a global level meta-analysis of the prevalence of PTSD, 22.25% (95% CI: 16.71–28.33) among RTA [36] and earthquake survivors [37], respectively. However, the pooled prevalence of PTSD in the current review was higher than the reported prevalence of PTSD (19.2%) in Iran among accident survivors of a sample of commercial motor vehicle drivers [11] and a prevalence of PTSD (5%) among samples (n = 80) of survivors of a mass shooting incident at a courthouse in the US [38]. Likewise, our pooled estimate was higher than a national survey in the US, that informed 20% of those uncovered to physical attack experienced PTSD [39], and a reported 4.2%, 12.2% and, 12% of probable PTSD among battle injured soldiers in the US screened in the 1st, 4th and 7th months of follow up period consecutively [40].

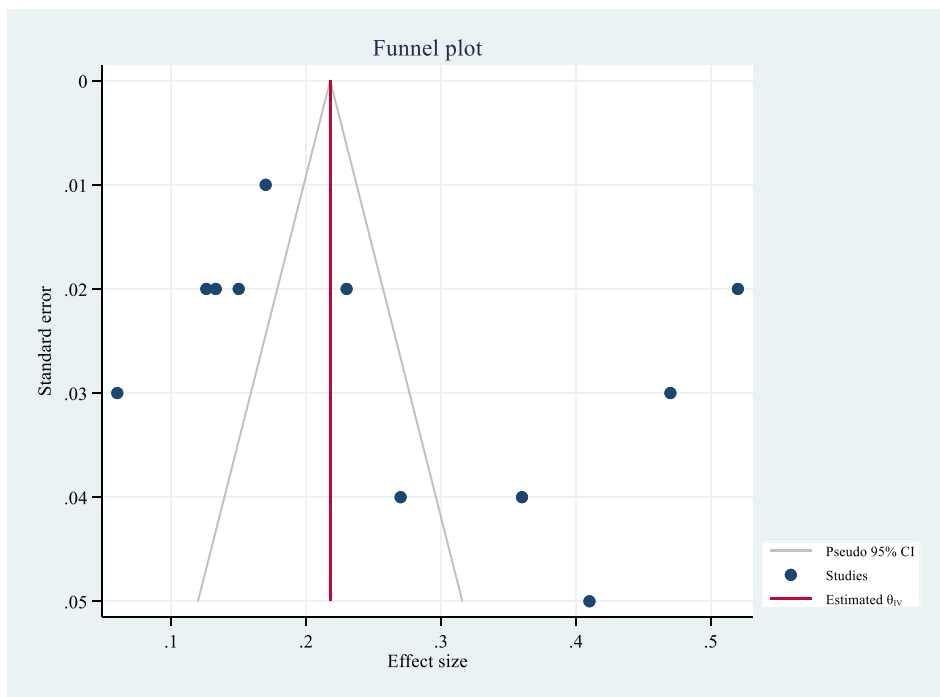


Figure 4. Funnel plot for publication bias of included studies.

In contrast, our pooled estimates of PTSD in the current review was lower than a reported prevalence of PTSD (41%) in California among hospitalized trauma survivors with acute injuries [9] and 36.6% in Serbia among survivors of a vehicle accident [10]. The discrepancy in the reported prevalence of PTSD might be due to the difference in study participants' exposure to a varying degree of trauma, utilization of different tools (screening and diagnostic tools) to examine PTSD and using different study designs. Compared with developed countries, African countries have reported increased road traffic injuries (RTIs), and mortality in the past 30 years [41]. The 2015 WHO Global status report on road safety have shown that Africa had the highest morbidity secondary to RTIs (26.6 per 100 000 population), which could subsequently

increase the burden of PTSD [42]. The significant burden of PTSD among RTA survivors could be due to experiencing pain symptoms attributed to injuries sustained during their accident, and the reported pain might affect standard of living and cause impairment, leading them to substantial distress [40]. Also, some degree of fear, anger, paranoia, and short-term adjustment issues and disability are expected responses following RTA [43].

In our subgroup analysis, the pooled prevalence of PTSD among RTA survivors was higher in the studies that used screening tools (30%, 95% CI: 14–46) compared to the studies that used the diagnostic tool 23% (95% CI: 12–34). The difference could be due to the variation in PTSD instruments, which could be linked to the discrepancy in the tool's

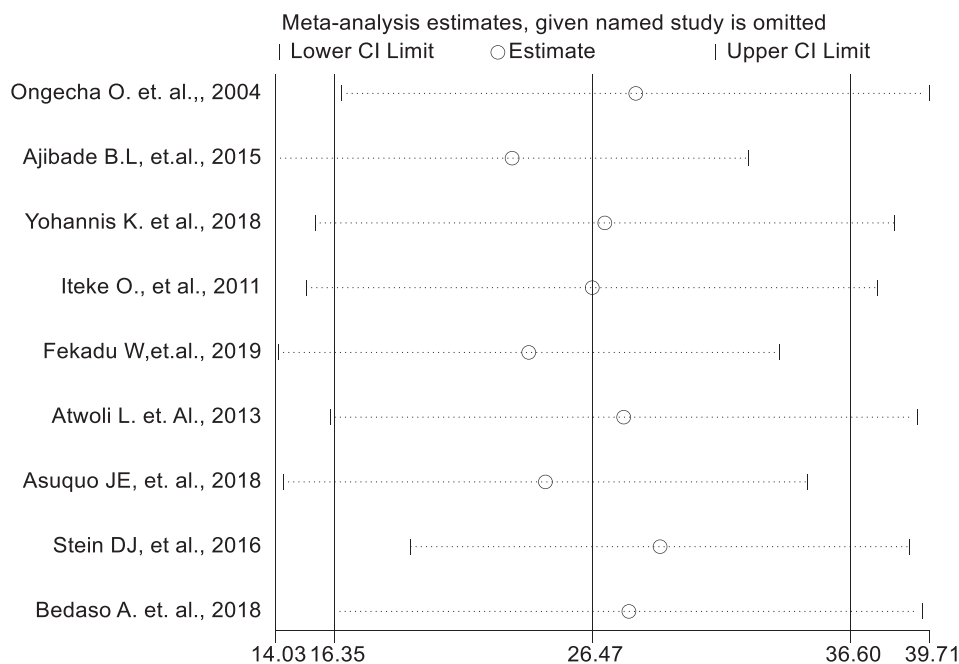


Figure 5. Sensitivity analysis of prevalence of PTSD among RTA survivors in Africa, a study being removed at a time: prevalence and 95% CI (The analysis is based on Random effect model).

Table 3. Factors associated with PTSD among RTA survivors in Africa.

Factors associated with PTSD	AOR/RR (95% CI)	Strength of Association	Factor type	Reference
Being female	AOR: 2.23 (1.40–3.56)	Moderate, Positive	Risk factor	(Yohannes et al., 2018)
Poor social Support	AOR: 2.1 (1.34–3.46)	Moderate, Positive	Risk factor	(Yohannes et al., 2018)
Depressive symptoms	AOR: 3.46 (1.99–5.99)	Strong, Positive	Risk factors	(Yohannes et al., 2018)
	AOR: 2.58 (1.10–6.10)	Moderate, Positive		(Bedaso et al., 2020)
	AOR: 3.32 (1.36–5.12)	Strong, Positive		(Alenko et al., 2019)
1-3month (Duration post-accident)	AOR: 1.72 (1.07–2.76)	Moderate, Positive	Risk factor	(Yohannes et al., 2018)
	AOR: 0.33 (0.15–0.73)	Strong, Negative	Protective	(Bedaso et al., 2020)
High-average education level	AOR: 0.10 (0.01–0.82)	Strong, Negative	Protective	(Lukoye Atwoli et al., 2013)
Never married	AOR: 37.64 (2.22–639.50)	Strong, Positive	Risk Factor	(Lukoye Atwoli et al., 2013)
None/slight sleep problem	RR: 0.42 (0.29–0.63)	Strong, Negative	Protective	(Fekadu et al., 2019)
Witnessing death during an accident	RR: 1.31 (1.03–1.68)	Moderate, positive	Risk factor	(Fekadu et al., 2019)
Extreme impact on family relationship	RR: 2.18 (1.62–2.92)	Moderate, Positive	Risk factor	(Fekadu et al., 2019)
History of a previous accident	AOR: 2.67 (1.23–5.77)	Moderate, Positive	Risk factor	(Bedaso et al., 2020)
Common mental disorder (CMD)	AOR: 12.78 (5.56–29.36)	Strong, Positive	Risk factor	(Bedaso et al., 2020)
A history of near-miss road traffic crash (RTCs)	AOR: 3.49 (1.89–6.43)	Strong, Positive	Risk factor	(Alenko et al., 2019)
Severe-risk cannabis use	AOR 2.51 (1.96–7.52)	Moderate, Positive	Risk factor	(Alenko et al., 2019)

psychometric properties [42]. A screening tool increases case detection as it includes probable PTSD cases compared with a diagnostic tool, which might inflate the prevalence of PTSD [43].

Further, we have used the country the study is based on as a moderator to conduct a subgroup analysis. The pooled prevalence of PTSD was higher (40% (95% CI: 26–55)) in the studies from Nigeria when compared to a study from South Africa (19% (95% CI: 3–36)). The possible explanations may be from the three studies conducted in Nigeria; two employed case-control study designs, which might inflate the prevalence compared to with the pooled estimate of 3 cross-sectional studies from South Africa. Also, during a case-control study design, a researcher might choose subjects deliberately as they have the disease, which might increase the prevalence of PTSD compared with a cross-sectional study design. Lastly, the higher prevalence of PTSD in Nigeria could be related to a higher number of RTA in Nigeria compared with South Africa. Nigeria reported the highest morbidity (4120/100 000) and mortality (160/100 000) secondary to RTI [44].

Our review identified that RTA survivors who reported low social support were highly likely to experience PTSD. RTA survivors who get less social support lack individuals to confide in or get assistance in reducing the negative emotions linked with a traumatic event, which might expose them to face the stress alone and later experience PTSD [45]. Moreover, RTA survivors who get less social support are weak in interrelating with the social network, are lonely, have poor stress-coping ability, and later develop PTSD [45, 46]. Also, social support can reduce the risk of PTSD by enhancing self-esteem and decreasing negative thoughts [47].

Our review also found that the RTA survivors who never married/divorced have a higher risk of PTSD when compared to those who are married [31]. Marital status is the key sources of support [48] and any help from a marital partner and the stability of marital relationship are also crucial PTSD protective factors [49]. Evidences demonstrated that less companion support was more common in separated partners, which might result in a higher risk of PTSD [50, 51].

The risk of PTSD among RTA survivors was higher among females than males [29]. This could be due to women’s experience of mental health problems such as premenstrual dysphoric disorder (PMDD) and perinatal depression, which have an association with changes in ovarian hormones which might add to the observed dissimilarity in the risk of PTSD among female RTA survivors [52]. Besides, the differences in the risk of PTSD associated with gender might also be related to behavioral factors such as differences in stress coping strategies and/or differences in perception of trauma [53, 54, 55]. For instance, evidence has shown that negatively interpreting trauma is more common among female trauma survivors than male counterparts [54].

Our review identified that comorbid common mental disorder (CMD) and depression were significantly associated with PTSD among RTA survivors [34, 35]. RTA survivors with pre-identified psychiatric disorders could have a higher risk of PTSD leading to diminished functionality and quality of life. Also, mental health comorbidity could affect a person’s ability to cope with the trauma, which will delay the recovery process.

4.1. Limitations

The major limitation of our study is the restriction applied to include only studies published in English could lead to publication bias. Besides, we got studies only from four African countries, limiting the continent’s representativeness of the review. It should also be noted that our review conducted a literature search only from three databases, namely CINAHL, PubMed, and PsychINFO. The absence of patient-level data and varying degrees of confounder adjustment across included studies are also limitations of the current review.

5. Conclusion

Our meta-analysis found a 26% pooled estimate of PTSD among RTA survivors in Africa. Further, 30 and 23% pooled prevalence of PTSD was found among RTA survivors that used screening and diagnostic tools, respectively. The concerned stakeholders must address this problem by setting prevention and treatment strategies for PTSD at a health facility. In addition to physical and medical management, there should be early screening and appropriate management of PTSD among RTA survivors.

Declarations

Author contribution statement

All authors listed have significantly contributed to the development and the writing of this article.

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Data availability statement

Data included in article/supp. material/referenced in article.

Declaration of interest’s statement

The authors declare no conflict of interest.

Additional information

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