



# State of the Art of Research on Human Trafficking

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## 1 Sex Trafficking

Sex trafficking is identified as the leading type of human trafficking globally and the most researched as opposed to other forms of trafficking such as forced labor or organ trafficking [1]. Sex trafficking is defined as a commercial sex act that is forced or prompted by fraud or coercion, or if the act is forced onto a child [2]. The current published systematic review literature on sex trafficking identified similar themes in the research such as serious health outcomes, poor access to medical care and other supportive services, and inadequate legal and medical policies and protocols.

*Gender.* Most of the sex trafficking research published focuses on women, followed by children, then a small percentage focuses on men [3–5]. The frequency of studies focusing on female victims leads to a gap in evaluating the male victim experience.

*Health Outcomes.* There is a significant amount of research that is focused on the physical and mental health outcomes of trafficking survivors [1]. However, the methods used by many of these studies lack validity and reliability along with neglecting other facets of one's person, such as their sexual, spiritual, and social health needs [1]. Armstrong and Greenbaum found through their systematic review many victims sought care for a variety of reasons, including reproductive concerns, violence-related issues, and chronic disease management [2].

Many victims experienced significant physical symptoms after being trafficked, including injuries, malnutrition, varied aches and pains, and insomnia. Additionally,

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there were reports of reproductive issues, including pregnancy, forced abortions, sexual assault and violence, and sexually transmitted infections [6].

Additionally, Talbott et al. found very little is taught in medical or health care curricula to prepare professionals to care for trafficked patients [6]. There is also a lack of resources to guide practice in assessing and treating these victims. This educational and practice gap leaves health care professionals unprepared and patients without quality and informed care.

*Prevalence of mental health problems.* When investigating psychosocial outcomes and resources, the research focus has been mainly on children, leading to a gap in understanding how adult survivors cope and utilize mental health care after being trafficked [7]. Interestingly, Casassa, Knight, and Mengo identified in their scoping review that victims can become trauma bonded to their traffickers [8]. This bond occurs due to the complexities of the relationship. Many victims have poor familial relationships or a history of abuse, which leave them with feelings of gratitude or love for the trafficker who “rescued” them. Traffickers use this vulnerability to manipulate the victim, which includes techniques such as isolation, violence, and alternative behaviors of kindness and abuse to gain control [8]. To move forward, victims need to break this trauma bond for healing, yet there is no research on adequate interventions for this endeavor. Therefore, this is a gap in the literature that should be addressed to help victims become survivors of sex trafficking.

Moreover, substance abuse was identified as one of the leading risk factors for individuals being trafficked [2, 9]. Once they enter sex trafficking, drugs and alcohol were found to be coping mechanisms among victims [2]. Along with substance abuse, Talbott et al. identified high incidences of posttraumatic stress disorder (PTSD) and depression among sex trafficking survivors [6].

*Prevention.* There were significant findings in the published literature that policies, both on a macro- and micro-level, need to be robust and implemented more effectively [5, 7]. This includes researchers identifying root causes or risk factors in victims, such as poverty, poor family relations, and substance abuse [3, 4, 7, 9]. Haney et al. found the United States (U. S.) anti-trafficking policies are widely varied [9]. It is important to streamline a national policy on anti-trafficking to better identify, respond to, and control human trafficking cases [9]. Additionally, Okech et al. identified the need for better collaboration between stakeholders and policymakers to effectively address anti-trafficking initiatives that provide support to victims while punishing offenders. The lack of legal ramifications toward traffickers is a continual problem, leading to a further increase in human trafficking incidences [7].

Upon review, Armstrong and Greenbaum found little evidence of human trafficking response protocols within the hospital setting, which is where many trafficking victims could be identified and rescued [2]. They recommend a formal screening process to identify and assist victims. Moreover, Talbott et al. found a lack of competency among health care providers related to referral services needed for sex trafficking victims. They recommend a collaborative and multi-disciplinary approach to meet the holistic needs of survivors [6].

*Methodological issues.* Overall, there is a lack of empirical data in all aspects of human trafficking research, with most studies utilizing qualitative measures [3, 5, 7]. With this deficiency of data, there is a lack of rigorous experimental designs, and many researchers utilize semi-structured interviews to gather data [3, 7]. Furthermore, there is a need for validated scales and more intervention-based studies to create an impact in sex trafficking research [3]. Since many survivors will need a multi-prong approach to recovery and rehabilitation, it is recommended that researchers work in interdisciplinary teams [7].

Barrick & Pfeffer identified in their scoping review that the measurement of sex trafficking prevalence is widely varied, and researchers use inadequate methods. They recommend studying trafficking prevalence at micro-levels, by focusing on small sections of the population in specific geographical regions. This will improve the ability to assess prevalence [10].

*Future directions.* To meet the needs holistically of trafficked survivors, it is important to develop and implement robust policies to ensure victims are not criminalized, and offenders face consequences for their crimes [4, 9]. Additionally, since many survivors leave trafficking with physical and mental health issues, health care curricula need to address this content in both informal and formal ways to improve care [6]. Similarly, Graham et al. identified the need for improved abilities to assess and treat survivors, strategies to improve coping skills, and substance abuse treatment [1]. They also recommended a standardized intake assessment to holistically meet the needs of the patient.

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## 2 Forced Labor

Forced labor, or labor trafficking, is defined as a person unable to freely leave their work or are recruited to work by force, fraud, or coercion. Additionally, debt bondage can be involved and is trifold: the victim has a debt to pay off, they cannot repay the debt, and they cannot leave freely because of this debt [11]. While this is a formal definition of this type of human trafficking, it has been proven difficult to identify and control labor trafficking for law enforcement due to the legal and employment nuances [12].

*Gender.* Overall, men are most affected by labor trafficking due to the nature of the labor, which is often in agriculture, mining, construction, and manufacturing [13, 14]. Migration can also influence an uptick in forced labor, as men seek financial support to enter affluent countries, such as the US [15]. There are very few articles investigating female involvement in labor trafficking, such as domestic servitude [5].

*Health Outcomes.* Within forced labor, health problems are common and include factors that affect a person's health from all facets, including occupational, environmental, and social determinants of health [11]. Those in the mining industry are at risk for exposure to hazardous chemicals and dust, lack safety training which can lead to accidents, and experience common illnesses including mosquito-borne or diarrheal diseases from standing water or poor sanitation [11]. Those in the fishing industry are at risk for exposure to severe weather at sea, accidents, and

health conditions like hypertension and mental health illnesses [15]. In combination with these health outcomes, forced laborers have poor access to quality water, food, and medical care [11, 15].

Similarly, Cockbain et al. found that labor trafficking victims were controlled violently or through isolation by traffickers and lived and worked in unsafe and poor conditions [13]. There were reports of aches and pains associated with the victims' work as well as high incidences of mental health disorders, such as depression, anxiety, and post-traumatic stress [13]. Victims also had poor or inadequate access to support and health services.

*Methodological issues.* When exploring forced labor in the fishing industry, Pocock et al. found that several researchers did not report ethical approval, were unclear in their analysis whether it was qualitative or quantitative, and reported findings that were difficult to interpret [15]. Furthermore, there are very limited publications on forced labor that include scientific data with most reporting anecdotal evidence [13]. Similar to Pocock et al., Cockbain et al. found there was a lack of methodological transparency and poor analytical rigor in much of the published literature. Additionally, studies were mostly descriptive or exploratory in nature with non-random sampling techniques.

*Future directions.* For future research endeavors, there needs to be an exploration of women, domestic servitude, and children in forced labor [5, 11]. Additionally, studies need to be transparent in their methodology and report accurate and precise data. There needs to be adequately defined laws and statutes on labor trafficking along with formal policies for law enforcement when apprehending traffickers and assisting victims [7, 12]. Lastly, consumers can verify products are made or resourced through slavery-free avenues which will lead to a decrease in the demand for forced labor [7].

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### 3 Organ Trafficking

Organ trafficking is a type of human trafficking that involves the recruitment, transport, or receipt of organs from vulnerable persons using force, abduction, or abuse of power and is received by individuals with the means to pay for the organ [16]. Individuals may be trafficked for their organs due to the vulnerability of financial insecurity or without one's consent. The impetus for organ trafficking is the lack of supply versus demand and is fueled by individuals in health crises needing organ transplantation and having the means to purchase one [16, 17].

Human morbidity and mortality have increased significantly regarding cardiovascular disease, kidney disease, and diabetes, thereby making the need for organ transplantation greater [17]. The World Health Organization has estimated around 10,000 kidneys have been trafficked as this organ is the most frequently desired. However, other organs that can be trafficked include the heart, lungs, liver, and pancreas along with human tissue [17].

*Health Outcomes.* Very little in the available research identifies concrete health outcomes related to a victim being trafficked for their organs. Most literature states

death or other severe health consequences occur to the victims, which could be interpreted as infections or disability from poor surgical technique or a lack of postoperative care [16]. However, this information in the systematic review literature is not detailed and does not outline the mental health implications for a victim of organ trafficking or their surviving family.

*Methodological issues.* There is limited published literature on organ trafficking and its real impact on vulnerable communities. However, the literature that is published is more often found in medical and anthropological journals [5, 18]. There is a significant gap in published research within the social sciences and humanities [18]. Additionally, much of this research originates in Western countries, such as the US or the United Kingdom (UK), which are more affluent. An understanding of the trade in poorer countries is lacking despite these areas being the most vulnerable to organ trafficking. Also, Columb's review of the published literature found that much of what is available is anecdotal, lacking in evidence-based studies with quantifiable and reliable data on the incidence and impact of organ trafficking [17].

*Prevention.* Columb argues that better investment in primary care would decrease the demand for an illegal organ trade due to individuals not requiring a last-resort treatment such as organ transplantation [17]. Additionally, more robust legal ramifications and evidence related to organ trafficking could further prevent these crimes.

*Future directions.* To impact a decrease in organ trafficking, it is imperative to utilize research methods that will obtain evidence-based and quantitative data. This data can be used to impact legal repercussions for traffickers as well as better support victims of organ trafficking. Additionally, more information needs to be gathered from poorer, more vulnerable countries, outside affluent, Western countries. For instance, research projects based in countries located in South America or Africa where vulnerability is high and formalized transplant services are low [17].

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## 4 Child Marriage

Child marriages are defined as those marriages that occur when one partner is less than 18 years old. The prevalence of child marriages is difficult to estimate as children may be removed by parents or guardians from their current country of residence to be married in another country, thus making record tracking more difficult [19]. In addition, self-report of age at the time of marriage may not be accurate and underestimate the prevalence [20]. Estimates of child marriage vary across countries but have been reported as high as 12 million girls annually, with the highest prevalence in sub-Saharan Africa [19]. Over the past decade, three major systematic reviews have been performed examining the literature on different aspects of child marriage.

*Health Outcomes.* In their systematic review of the literature on the health consequences of child marriage, Fan and Koski identified six major areas of possible adverse health outcomes related to child marriage: (1) births—timing, birth intervals,

or unwanted pregnancies; (2) contraceptive use; (3) use of maternal health care; (4) intimate partner violence; (5) mental health; and (6) nutritional status [21]. Women who are married before the age of 18 are more likely to give birth before the age of 18 when compared with their peers. Studies regarding birth intervals among child brides were mixed; some studies have reported an increase in a less than 2-year birth interval and others found no difference. Similarly, there were mixed results across studies examining unwanted pregnancies among child brides. Concerning the use of contraceptives, Fan and Koski found that results varied by country. Studies based in Africa found that child marriage was associated with lower use of contraception; however, in India and Bangladesh, the likelihood of using contraception increased among child brides [21]. With regard to maternal health care, child brides in Pakistan, Nepal, and India were less likely to receive prenatal or postpartum care, and all studies reported that child marriage decreased the likelihood of delivering in a health care facility. All studies found that child marriage was associated with increased physical and emotional violence. Consistently across the reviewed studies were the increased likelihood of depressive symptoms, anxiety, and overall decreased psychological well-being. Results from studies that examined the effect of child marriage on nutritional status were mixed, some noting it could lead to vitamin deficiencies while others reported increased nutritional status with pregnancy [21].

*Prevention.* A systematic review of interventions to prevent child marriage revealed 6 studies out of 11 had a positive impact on decreasing child marriages following a community intervention [20]. Successful interventions included economic incentives to remain in school or a life skills curriculum. Interestingly, study sites were geographically diverse and located in Columbia, Mexico, Zimbabwe, and India. In general, efforts to keep children in school were associated with decreased child marriage.

*Future directions.* In their systematic review of gaps in research around child marriage, Siddiqi and Greene note that while greater attention has been given to studying the prevalence and consequences of child marriage over the past two decades, more emphasis needs to be placed on evidence-based interventions going forward [22]. While the United Nations has included a goal to eliminate child marriage by 2030 in the Sustainable Development document, rates of child marriage have not decreased substantially [23]. What is needed now is the development and implementation of culturally relevant interventions targeted in those areas and countries with the highest prevalence. In addition, the authors recommend more sharing of knowledge around child marriage across a variety of languages. Child marriage is a global problem, and the sharing of knowledge across countries could enhance the goal of eradicating this practice.

*Methodological issues.* As mentioned previously, this population can be difficult to reach. Child marriage is illegal in many countries and typically, subjects are the age of majority and/or out of the marriage when interviewed. Other methodological issues include a lack of longitudinal studies, large variation in study approaches, particularly by country, and self-reported age by subjects that may be inaccurate.

## 5 Child Soldiers

Child soldiers are children under 18 years old who have typically been coerced or abducted and forced to join the armed forces. In 2017, the United Nations Office for the Coordination of Humanitarian Affairs estimated that at least 300,000 children were believed to be serving as soldiers in armed conflicts across the globe [24]. Reviews of the literature on research related to child soldiers are sorely lacking and not recent. However, the seminal paper by Betancourt et al. categorized their findings from 14 observational studies, 5 interventional studies, and 2 prospective studies into a systematic review of the psychosocial adjustment and mental health of child soldiers [25].

*Gender.* Surprisingly, across the included studies, females comprised 30% of the participants. Former female child soldiers reported a higher severity of psychosocial problems than males across those studies that included gender as a variable. Three studies found that girls were more at risk for long-term mental health effects than boys after their experiences as child soldiers. However, the female gender could also be a positive moderating factor in responding to mental health interventions [25].

*Prevalence of mental health problems and protective factors.* Not surprisingly, PTSD rates were higher across all studies when compared to control groups. In addition, longitudinal studies reported elevated levels of depression, anxiety, and hostility. The measurement of mental health problems varied widely across studies with 10 studies utilizing validated measurements.

Most child soldiers experience some stigma around their former soldier status upon returning to their community. However, when child soldiers experience a higher level of family acceptance, mental health outcomes were generally better. Similarly, when former child soldiers experience social support and community acceptance, their psychosocial adjustment was better than their counterparts [25].

*Methodological issues.* Similar to other areas of trafficking, most studies are cross-sectional and frequently lack strong control or comparison groups. Many studies understandably utilize convenience sampling and, as a result, samples may be homogeneous. Thus, it is difficult to estimate the prevalence of mental health issues among former child soldiers. Many of the studies did not use strong sampling designs or comparison groups, making generalizing results difficult. In addition, many of the studies reviewed used measures to assess mental health symptoms expressed in higher resource or Western countries [25].

*Future directions.* Betancourt et al. recommend utilizing more mixed methods and longitudinal designs with this population [25]. In addition, refrain from making assumptions regarding the mental health problems among former child soldiers to avoid utilizing measures that are too narrow. Employing more participatory research approaches and locally defined research priorities could yield intervention approaches and priorities that serve the local community and those most affected by child soldiering.

## 6 Infant Trafficking

Infant trafficking, or black-market babies, encompasses the illegal selling of infants for adoption or for other purposes, such as child labor. To date, there are no published systematic reviews on research regarding infant trafficking. Most articles focus on Nigeria and infant trafficking. Salihu and Chutiyam described trends in baby trafficking in Nigeria; however, their review focuses predominantly on prevalence and location [26]. The dearth of information in the literature is not surprising as the practice is illegal across most countries, and thus, highly secretive. Factors that have contributed to the rise in infant trafficking are increased rates of infertility and lack of job opportunities, poverty, and loss of hope in countries such as Nigeria [26]. These variables have led to an increase in “baby factories” across Nigeria and Western Africa [27].

*Methodological issues.* The published literature on infant trafficking is predominantly anecdotal and/or observational. In addition, while there are possible adverse effects for infants, the abuse of surrogate mothers has not been adequately studied. Makinde et al. report that underage girls are often deceived, abducted, and then impregnated by their captors to produce infants for the black market [28]. These mothers may experience physical, psychological, and sexual violence, and the long-term effect on these underage girls is largely unknown. Some qualitative studies have documented anxiety, depression, PTSD, and addiction; however, larger studies are lacking [29, 30].

*Future directions.* What is most needed in this area is prevention research around educational interventions for young girls at risk in countries such as Nigeria. Longitudinal research on the long-term effects of abduction and/or coercion of surrogate mothers is also sorely lacking in the literature and should be included in future studies.

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## 7 Summary

This chapter has been a discussion of the state of the art of research in human trafficking via the analysis of recent systematic reviews on the six forms of trafficking discussed in this book. While many studies are currently being performed on aspects of the broad topic, it seems clear that methodological issues, access to samples, and focus from different disciplines do not yet present a cogent understanding of how to decrease one’s vulnerability to be trafficked. However, there is hope in the talents and commitment of many people globally who are dedicating their time, energy, and resources to address human trafficking as a global epidemic.

### Discussion Questions

- Compare and contrast the research questions asked and methods used in your discipline.
- Identify methodological issues within published human trafficking research.
- Describe strategies that can be used to enhance human trafficking research.



## References

1. Graham LM, Macy RJ, Eckhardt A, Rizo CF, Jordan BL (2019) Measures for evaluating sex trafficking aftercare and support services: a systematic review and resource compilation. *Aggress Violent Behav* 47:117–136. <https://doi.org/10.1016/j.avb.2019.04.001>
2. Armstrong S, Greenbaum VJ (2019) Using survivors' voices to guide the identification and care of trafficked persons by U. S. health care professionals: a systematic review. *Adv Emerg Nurs J* 41:244–260. <https://doi.org/10.1097/TME.0000000000000257>
3. Knight L, Xin Y, Mengo C (2022) A scoping review of resilience in survivors of human trafficking. *Trauma Violence Abuse* 23:1048–1062. <https://doi.org/10.1177/1524838020985561>
4. McBride MA (2020) Responding to victims of human trafficking in the United States: a review of the treatment providers. *Theses/Capstones/Creative Projects*. 81. [https://digitalcommons.unomaha.edu/university\\_honors\\_program/81](https://digitalcommons.unomaha.edu/university_honors_program/81)
5. Russell A (2017) Human trafficking: a research synthesis on human-trafficking literature in academic journals from 2000–2014. *J Hum Traffick* 4:114–136. <https://doi.org/10.1080/023322705.2017.1292377>
6. Talbott JMV, Dutcher JS, Pougner CA, Calvin SL, Roe-Sepowitz D, Kling JM (2020) Review of published curriculum on sex trafficking for undergraduate medical trainees. *Am J Prevent Med* 58:604–611. <https://doi.org/10.1016/j.amepre.2019.11.013>
7. Okech D, Choi YJ, Elkins J, Burns AC (2018) Seventeen years of human trafficking research in social work: a review of the literature. *J Evid Inf Soc Work* 15:103–122. <https://doi.org/10.1080/23761407.2017.1415177>
8. Casassa K, Knight L, Mengo C (2022) Trauma bonding perspectives from service providers and survivors of sex trafficking: a scoping review. *Trauma Violence Abuse* 23:969–984. <https://doi.org/10.1177/1524838020985542>
9. Haney K, LeBeau K, Bodner S, Czizik A, Young ME, Hart M (2020) Sex trafficking in the United States: a scoping review. *J Evid Based Soc Work*. <https://doi.org/10.1080/2640806.2020.1765934>
10. Barrick K, Pfeffer R (2021) Advances in measurement: a scoping review of prior human trafficking prevalence studies and recommendations for future research. *J Hum Traffick*. <https://doi.org/10.1080/23322705.2021.1984721>
11. Schwartz FW, Lee S, Darrah TH (2021) A review of the health issues related to child labor and violence within artisanal and small-scale mining. *GeoHealth* 5:e2020GH000326. <https://doi.org/10.1029/2020GH000326>
12. Farrell A, Bright K, de Vries I, Pfeffer R, Dank M (2019) Policing labor trafficking in the United States. *Trends Org Crime*. <https://doi.org/10.1007/s12117-019-09367-6>
13. Cockbain E, Bowers K, Dimitrova G (2018) Human trafficking for labor exploitation: the results of a two-phase systematic review mapping the European evidence base and synthesizing key scientific research evidence. *J Exp Criminol* 14:319–360. <https://doi.org/10.1007/s11292-017-9321-3>
14. Rioux S, LeBaron G, Verovsek PJ (2019) Capitalism and unfree labor: a review of Marxist perspectives on modern slavery. *Rev Int Polit Econ*. <https://doi.org/10.1080/09692290.2019.1650094>
15. Pockock NS, Nguyen LH, Lucero-Priso DE, Zimmerman C, Oram S (2018) Occupational, physical, sexual, and mental health and violence among migrant and trafficked commercial fishers and seafarers from the Greater Mekong Subregion (GMS): systematic review. *Global Health Res Policy*:3. <https://doi.org/10.1186/s41256-018-0083-x>
16. Alnour H, Sharma A, Halawa A, Alalawi F (2022) Global practices and policies of organ transplantation and organ trafficking. *Exp Clin Transplant* 8:717–731. <https://doi.org/10.6002/ect.202v0.0251>
17. Columb S (2015) Beneath the organ trade: a critical analysis of the organ trafficking discourse. *Crime Law Soc Change* 63:21–47. <https://doi.org/10.1007/s10611-014-9548-0>

18. Gonzalez J, Garijo I, Sanchez A (2020) Organ trafficking and migration: a bibliometric analysis of an untold story. *Int J Environ Res Public Health* 17:1–11. <https://doi.org/10.3390/ijerph17093204>
19. Malhotra A, Elnakib S (2021) 20 years of the evidence base on what works to prevent child marriage: a systematic review. *J Adolesc Health* 68:847–862. <https://doi.org/10.1016/j.jadohealth.2020.11.017>
20. Kalamar AM, Lee-Rife S, Hndin MJ (2016) Interventions to prevent child marriage among young people in low and middle-income countries: a systematic review of the published and gray literature. *J Adolesc Health*. 59:S16–S21
21. Fan S, Koski A (2022) The health consequences of child marriage: a systematic review of the evidence. *BMC Public Health* 22:309–336. <https://doi.org/10.1186/s12889-022-12707-x>
22. Siddiqi M, Greene ME (2022) Mapping the field of child marriage: evidence, gaps and future directions from a large-scale systematic scoping review. *J Adolesc Health* 70:S9–S16
23. United Nations (2022) Sustainable development goals. <https://sdgs.un.org/goals>. Accessed 9 Feb 2023
24. United Nations. Child recruitment and use. <https://childrenandarmedconflict.un.org/six-grave-violations/child-soldiers/>. Accessed 9 Feb 2023
25. Betancourt TS, Borisova I, Williams TP, Meyers-Ohki SE, Robin-Smith JE, Annan J, Kohrt BA (2013) Research review: psychosocial adjustment and mental health in former child soldiers—a systematic review of the literature and recommendations for future research. *J Child Psychol Psychiatry* 54:17–36
26. Salihu D, Chutiyami M (2016) Trends of child trafficking situation in Nigeria and a way forward. *Res Humanit Soc Sci* 6:31–37
27. Makinde OA (2016) Infant trafficking and baby factories: a new tale of child abuse in Nigeria. *Child Abuse Rev* 25:433–443
28. Makinde OA, Olaleye O, Makinde OO, Huntley SS, Brown B (2015) Baby factories in Nigeria: starting the discussion toward a national prevention policy. *Trauma Violence Abuse* 18:98–105
29. Konstantopoulos WM, Ahn R, Alpert EJ, Cafferty E, McGahan A, Williams TP, Castor JP, Wolferstand N, Purcell G, Burke T (2013) An international comparative public health analysis of sex trafficking of women and girls in eight cities: achieving a more effective health sector response. *J Urban Health* 90:1194–1204
30. Tsutsumi A, Izutsu T, Poudyal AK, Kato S, Marui E (2008) Mental health of female survivors of human trafficking in Nepal. *Soc Sci Med* 2008(66):1841–1847