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**Child labour in low and middle income countries and its consequences for mental health: a systematic literature review of epidemiologic studies**

Sarah Sturrock

Imperial College London School of Medicine

South Kensington Campus

London SW7 2AZ

[sarah.sturrock11@imperial.ac.uk](mailto:sarah.sturrock11@imperial.ac.uk)

Tel:07855478360

Dr Matthew Hodes

Centre for Mental Health

Hammersmith Hospital Campus

Imperial College London

7th Floor Commonwealth Building

Du Cane Road

London W12 0NN

Tel – 44(0)208 383 4161 Fax – 44(0)208 383 4160

Email: [m.hodes@imperial.ac.uk](mailto:m.hodes@imperial.ac.uk)

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## Abstract

### Purpose

In low and middle income countries large numbers of children are involved in work. Whilst studies have shown that child labour may be harmful to children's physical health, little is known about child labour's effects on mental health. It is important to understand the relationship between work and mental health problems during childhood, and identify possible risk factors for poorer mental health.

### Methods

A systematic literature review was conducted. Published papers in any language that compared the mental health of children (<18 years) who had been exposed work with those who had not been exposed to work were included.

### Results

Twelve published observational studies on the association between child labour and general psychopathology, internalizing and externalizing problems were identified. Child labour was found to be strongly associated with poor mental health outcomes in seven studies. More significant associations were found between child labour and internalizing problems than externalizing problems.

### Conclusions

The burden of poor mental health as a result of child labour is significant given the numbers of children in work. Risk factors for poorer mental health were involvement in domestic labour, younger age, and greater intensity of work, which could be due to the potential of child labour to cause isolation, low self-esteem, and perception of an external locus of control. The risk factors suggested by this review will have implications for policy-makers. Additional research is needed in low income countries, risk factors and also into the potential psychological benefits of low levels of work.

## **Introduction**

Child labour can be defined as the production of economic goods and services by children (under 18 years) as defined by the United Nations System of National Accounts[1]. This definition has been used in previous research, and is the definition used in this paper. It needs to be borne in mind that many children help their parents around the household and in family agricultural tasks that contribute to the economic productivity of the family.

A contrasting definition is that from the International Labour Organisation (ILO), responsible for child labour advocacy: child labour is "work that deprives children of their childhood, their potential, and their dignity, and that is harmful to physical and mental development"[2]. Their "worst forms of child labour" pose a clear risk to a child's health, including: the use of children in armed conflicts, drug trafficking, slavery or sex work[2]. However, this definition is problematic as it prejudges involvement in work as necessarily detrimental to health.

Child labour is more common in lower-income than high income countries[3]. One in seven children worldwide are exposed to child labour[3], an estimated 215 million children[3]. The highest proportion of children working is in Sub-Saharan Africa (25.3%)[3]. Child labour is decreasing, amongst girls globally, and most rapidly in Latin America and the Caribbean[3].

Child labour is harmful to physical health, with 2.7 million years of healthy life lost yearly[4]. An earlier systematic review by Fekadu, in 2010[5], identified possible reasons why child labour affects mental health. Firstly, many hours of high-demand, repetitive work over which children have little control may cause demoralisation, and hopelessness[6]. Secondly, children may experience more adult responsibilities, such as concern regarding debt[7]. Thirdly, it may cause isolation from their families, if the children need to migrate for

work [8], or from peers if the work is degrading[9]. Fourthly, school enrolment decreases with increasing employment[10], and children's loss of opportunities may harm their mental health further. However, some work may be positive for mental health and development if it teaches useful skills, improves self-esteem, and lifts families out of poverty[11]. Early mental health harm could cause lasting psychopathology[12]. It is unclear what work is harmful, making it difficult to protect children.

Research into the mental health consequences of child labour is scarce [2][4]. Fekadu's review on child labour and mental health was focused on work defined as 'child labour', domestic labour and street work[5], so would not have included studies of less harmful forms of work done by children.

This review aims to examine the relationship between all forms of work by children and mental health to determine whether there is an association, and whether any moderating factors can be identified that either protect children's mental health, or that make the exposure to labour more damaging. Child labour will be taken to mean 'any work done by children under the age of 18, outside of domestic chores within the family', to capture a spectrum of work, as discussed above[2]. This review aims to identify the boundaries of what might be harmful or safe. It is restricted to low- and middle-income countries, as the necessity for work and regulatory issues would be similar, and different to high-income countries.

## **Methods**

### **Inclusion and Exclusion Criteria**

Studies were sought in all languages. Published observational studies including participants under 18 years of age exposed to work (economic activity or non-domestic unpaid work) and an unexposed comparison group in countries listed as low- or middle-income by the World Bank were included[13]. Studies must have specified the nature, intensity, and/or duration of the work.

Studies were eligible if they examined the prevalence of mental health symptoms (of any disorder) or substance misuse in the exposed and non-exposed children. Studies must have used a standardised assessment instrument, either a questionnaire or psychiatric interview for mental health symptoms. Symptoms for depression include sadness, tearfulness, anhedonia, irritability and lack of energy, and symptoms of anxiety include fearfulness, nervous or clingy behaviour in new situations, and avoidance, which together are categorised as internalising problems. Symptoms of conduct disorder such as lying, stealing, fighting and destructiveness of property, and symptoms of ADHD, inattention, overactivity and impulsivity, are categorised as externalising problems. Studies are reported according to the association of child labour with general psychopathology, internalising and externalising problems. Substance misuse behaviour was included where it was reported in sufficient detail (i.e. not only specified if substance misuse was ever used or not used).

Studies were excluded if the measurement of child labour was limited to 'exposed' vs. 'not exposed'. Studies without a comparison group were excluded. Educational outcomes were not included. Types of child labour defined by the International Labour Organisation (ILO) as the 'worst forms of child labour' were excluded[14]: sex work, drug trafficking, use

of children as soldiers, and sale or trafficking of children (slavery), as these forms of labour are associated with specific forms of coercive relations, and risk factors (such as war and organised violence) including physical harms (including war trauma, sexual and physical assault). Qualitative studies were excluded.

### Search Strategy

The study question was broken into three concepts ('child labour', 'substance misuse', 'mental health') and these were transformed into search criteria as subheadings and keywords. Four databases were searched on the 19th March 2015:

- Ovid EMBASE (Embase Classic+Embase 1947 to 2015 March 19)
- Ovid MEDLINE (In-Process & Other Non-Indexed Citations and Ovid MEDLINE 1946 to Present)
- Ovid PsycINFO (1806 to March Week 2 2015)
- Ovid Global Health (1973 to 2015 Week 11)

The reference lists of relevant review papers, and identified papers were also searched for additional studies.

### Selection of Studies

Search results were imported into Mendeley and duplicates removed electronically. All abstracts were screened to determine a shortlist of studies conducted in included countries that would need to be read in full to confirm that they met the full inclusion criteria. The

shortlist underwent a second round of screening where studies were read in full and their characteristics verified to produce a final list of studies for inclusion (see Figure 1).

One review author (SS) selected studies independently. Where there was uncertainty regarding inclusion, a co-author (MH) and a supervisor (TN) jointly reviewed the studies.

### Data extraction

Data extraction was performed using Apple Numbers to record outcomes of the studies, and key study characteristics.

### Assessment of Study Quality and Risk of Bias

Study quality was assessed using the Newcastle-Ottawa Scale adapted for Cross-Sectional Studies[15]. This scale scores studies on three principle categories: the selection of the sample, the comparability of the two groups and how the outcome has been measured (reporting and statistical analysis). The scores can range from 1-10. This scale was adapted from the Newcastle-Ottawa Quality Assessment Scale for non-randomised studies in meta-analyses. The validity of the original scale has been critically reviewed by experts and its inter-rater reliability is established[16]. As there is no defined score corresponding to a ‘high quality’ study using this scale, the mean quality of all included studies was calculated (=4.75) to provide a reference point for “high” (scoring  $\geq 5$ ) vs “low” quality studies.

## **Results**

### Search Results

The database search returned 3280 results. 12 papers were included in the review (see Figure 1).

Although some studies used the same outcome measures, heterogeneity in the study characteristics and instruments used meant that no summary estimate or meta-analysis could be carried out.

### Association between Child Labour and Psychopathology

#### General psychopathology

Most studies of general psychopathology found a significant association with exposure to work (Figure 2).

Figure 2 here

Most importantly, 4 of 7 high quality studies finding a significant association between exposure to work and general psychopathology, including studies in Ethiopia[17], Turkey[18], Brazil[19], the Philippines and India[20]. One high quality study found an inverse association between exposure to work and general psychopathology[21]. These outcomes had been measured using interview-based assessments, and self-report and informant completed questionnaires.

#### Internalising Problems

Most studies of internalising problems (4 of 7) found a significant association with exposure to work, including 3 of 4 high quality studies(fig. 3).

Figure 3 here

Exposure to work was associated with anxiety disorders[17], mood disorders[17], somatic complaints[18], and social and thought problems[18], with odds ratios as high as 6.65[17]. Three of these studies were interview based[17][22][23], with the other being questionnaire-based[18]. Fekadu et al used the Diagnostic Interview for Children and Adolescents (DICA) as an interview to 1000 children, and found that 99/528 labourers had a DSM diagnosis other than disruptive behaviour, whilst only 56/472 controls did[17]. De Baessa similarly carried out an interview to 43 working and 43 non-working children using the Child Depression Inventory[23]. Working was significantly associated with negative self-esteem,  $p=0.02$ [23]. Bordin administered the Child Behaviour Checklist, to the mothers of 212 children, 17 of whom had been exposed to work[22]. 7 of the working children had internalising problems and 34 of the non working children, odds ratio 3.91 (1.29-11.91)[22]. Kiran administered the Youth Self Report questionnaire, to 726 participants[18]. The odds ratio was 2.4 (1.1-5.2) for internalising problems if the child was working >30 hours per week, with 157 participants working regularly[18].

Some used non-random sampling[24], had small sample sizes[23], or were conducted as a questionnaire as opposed to interview[25]. Nuwayhid's paper administered the Children's Manifest Anxiety Questionnaire to 78 working children and 60 controls but found no association[24]. Zinn-Souza used the Patient Health Questionnaire's depression module with 724 students[25]. Of the participants found to be depressed, 14 were not working, 24 were working, and 16 were 'unemployed'[25].

Alem's paper used the Self Reporting Questionnaire for Children for screening, and the DICA, both administered as interviews to children[21]. Of 2000 child labourers, using the Self Reporting Questionnaire for Children, 8.5% were identified as having a mental health problem, compared to 14.0% of 400 non-labourers ( $p < 0.001$ ) [21]. 'Excess fear' was significantly more common in non-labourers using the Self Reporting Questionnaire for Children ( $p=0.002$ ), and this was confirmed by both phobia and enuresis with phobia being more common in non-labourers using the DICA ( $p=0.036$  and  $p=0.005$  respectively)[21].

### Externalising Problems

There were only three studies of externalizing problems. Two of these did not find a significant association with exposure to work[17][22].

These studies were all of a high quality with good statistical analysis, so this could be a genuine negative finding despite the relative lack of data.

### Risks for Child & Adolescent Psychopathology

#### Type of Labour

The identified studies reported involvement in various types of work: domestic work, retail work, agriculture, and others. Two studies suggested domestic work was more harmful, with domestic workers reporting more trouble getting along with others[21]. Additionally, Hesketh's study revealed poor working conditions for domestic workers[20], with the majority not having a day off. High levels of work (>10 hours daily) was associated with a lower psychosocial health score[20].

#### Work Intensity and Duration

The studies found that children were working many hours. The mean number of hours worked was as many as 6.7 hours daily[26] and 42.9 hours per week[27]. The number of lifetime hours [22] and the age at which work started[28] were significantly associated with poor mental health.

#### Influence of Socio-economic development

The majority of papers (7 in total) were in upper-middle income countries[28][25][22][29][18][30][24], with clear findings in 5 papers of significant association between exposure to work and poor mental health[28][22][29][18][30], and generally a high quality. The studies from lower-middle[20][23] and low income[21][17][26] countries had more mixed results with only 2 of 5 studies finding a significant association between work and poor mental health[17][20]. The mixed results from these lower-income areas may be partially explained by 3 of these studies scoring lower than the review mean for quality[23][26][20].

## **Discussion**

This review found that child labour is significantly associated with poor mental health outcomes in most situations (6 out of 7 high quality studies found a significant association). More papers found a statistically significant association between work and internalising problems (4 studies) than externalising problems (1 study), and more studies were conducted in upper-middle income countries (7) than in low- or lower-middle income countries (5).

More studies identifying a significant association were in upper-middle income countries. This may be because the studies in lower-income countries were of a lower quality, including the study with the smallest sample size[23]. However, child labour may be more common and therefore normalised in lower income areas, causing less victimisation.

Some risk factors were identified. Firstly, the number of hours worked was high at up to 42.9 hours per week[18][20][17][26][22][27], and there was a relationship between work intensity and mental health problems[22]. This could be due to an indirect effect, e.g. loss of schooling, or a direct effect, e.g. of exhaustion. The age at which work began was a risk factor[28]. This could be due to older children being more resilient, and coping better.

Domestic work was found to be particularly harmful[21][28]. Domestic workers living with employers may encounter abuse and isolation. Hesketh's study[20] showed that child domestic workers in India are subject to poor working conditions - only 8.6% had a day off and 31% were beaten or deprived of food if they "did something wrong" at work.

There are many possible mechanisms for the harmfulness of work. Children migrating for work or living with employers may be isolated from their families, causing feelings of loss and hopelessness[11]. Work may mean missing school and age appropriate learning, play, and peer interaction. Degrading or menial work can cause rejection by peers, damaging self-esteem[11], which could be exacerbated by employer abuse[11]. Cognitive

abilities could be harmed; a child learning a craft may increase their skills, but a child forced to miss schooling for monotonous work may lose academic ability and knowledge[31][11], also causing low self-esteem, hopelessness and despair.

Working children may lack legal protection and suffer changeable pay and expectations, making them feel powerless[11]. Employers may be unpredictable or ‘unjust’ in their punishments[11]. Therefore, children cannot adapt their behaviour to avoid punishment, further decreasing the sense of an internal locus of control and personal agency[11], which are associated with greater depression[32].

A strength of this review was the breadth of the database search. As synonyms for ‘child labour’ were used, studies of more socially acceptable work were identified, allowing suggestions of what makes work harmful. Additionally, the search included adolescents, allowing examination of whether older children are more resilient to work. The association between child labour and poor mental health was found to be stronger in younger children[28], or when starting work younger[28].

Reference lists, within studies read in full, were examined to identify further studies for inclusion, but none were identified that were not found in the search. Additionally, the only relevant systematic review identified did not reveal any additional studies. This supports the sensitivity of the search strategy.

The studies were mostly of a moderate-to-high quality, with 10 of 12 studies scoring 5 or higher on the Newcastle-Ottawa scale, due to strong design and generally large sample sizes. Instruments to measure outcomes were evaluated in multiple studies. Most studies (8 of 12) administered the questionnaires as interviews, which is the ‘gold standard’. Only 3 studies identified involved children filling out self-report questionnaires unsupervised. Appropriate statistical controlling of confounders facilitated separation of the effect of work

from other associated risks, such as poverty. The overall high quality of the studies suggests that the association between poorer mental health and involvement in work is likely to be robust.

Sampling methods were a weakness of the studies, including opportunistic and purposive sampling, which may introduce bias. Children sampled from charities may have better mental health than those without this support. Additionally, employers may not give access to children working in poor circumstances.

Outcomes were assessed using interviews and questionnaires. Whilst self-reports are sensitive for internalising problems, externalising behaviours are better reported by parents or teachers[33], as in only three of the studies. The majority may not have had sufficient sensitivity. The possibility that reverse causality was operating, so that the children with poorer mental health were involved in paid work, could not be excluded given the cross-sectional design of all the studies.

There are limitations to this review. The majority of research identified came from upper-middle income countries. More research is needed in lower income countries, where child labour may be more common, and as cultural factors may affect the consequences. Additionally, the exposure (involvement in work) was measured in different ways. The studies all identified children who were working and those who were not, but many different possible 'risk factors' were assessed. Some studies focused on the intensity of work, whilst others focused on the industry or conditions at work. This provides various potential associations with certain work factors, but makes comparison across studies difficult.

Another limitation is that the benefits of a low level of work had not been investigated in low- and middle-income countries. A modest amount of work (and payment) may provide valuable skills, aid development, and improve nutrition and quality of life.

Given the high levels of work some children are involved with, regulation of child labour is required. However, crude legislation may be counterproductive due to the high level of child poverty. For example, following a ban on child labour in India, wages for children decreased so poorer families sent more children to work[34]. Policies working to reduce poverty have been shown to be more effective in taking children out of work[35] than bans. It may be appropriate to regulate labour, perhaps reducing harmful forms such as domestic work[21][28]. Combining work and school was found to be more harmful than working on its own[27], so restricted hours may be safer, or school support. Alternatively, a minimum age may be helpful, as the association between work and poor mental health outcomes was weaker past the age of 13[28].

Much more research will be needed to clarify the risks so that child labour can be regulated in the most effective way to protect children's health.

## **Conclusion**

In conclusion, this review has shown that in low- and middle-income countries, exposure to work as a child is strongly associated with poor mental health outcomes in the majority of available studies.

Certain aspects of child work have been suggested as risk factors, such as the intensity of work, the type of labour and the child's age, which will all require further research in order to make appropriate policies to protect children. Regulation is required to enable children to achieve their rights and well-being.

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## **Tables and Figures**

*Figure 1: Study Selection Process*

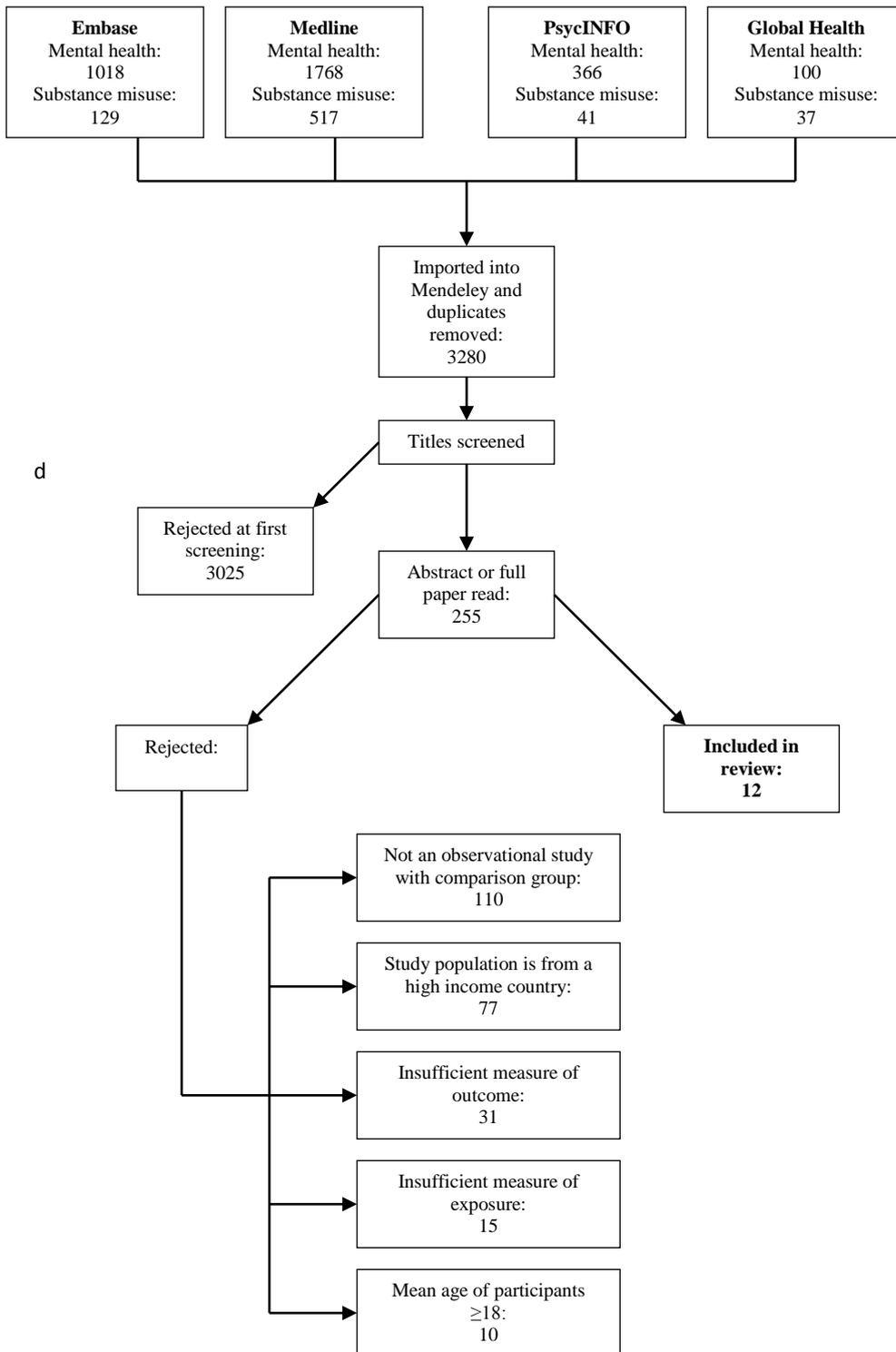


Figure 2: Number and Quality of Studies on General Psychopathology by Findings

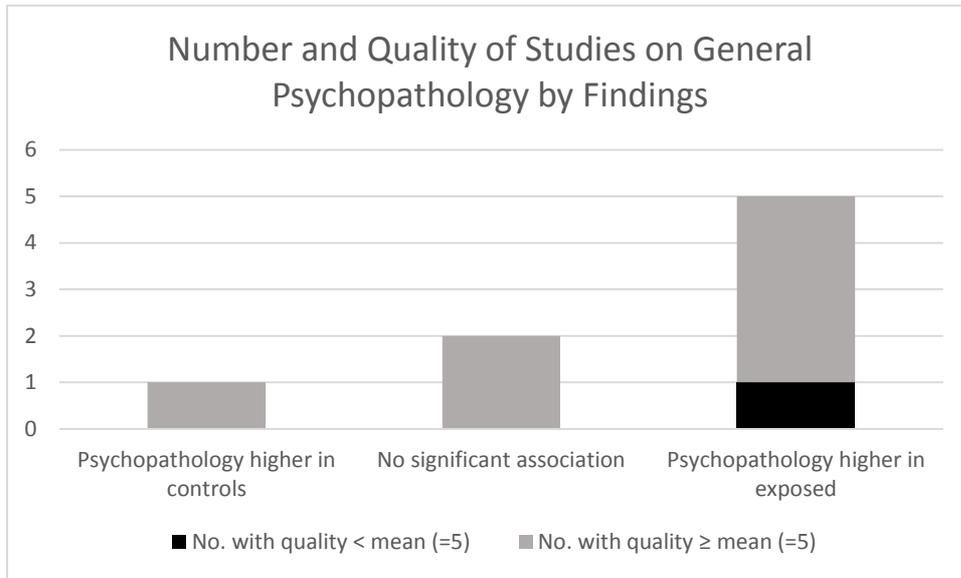
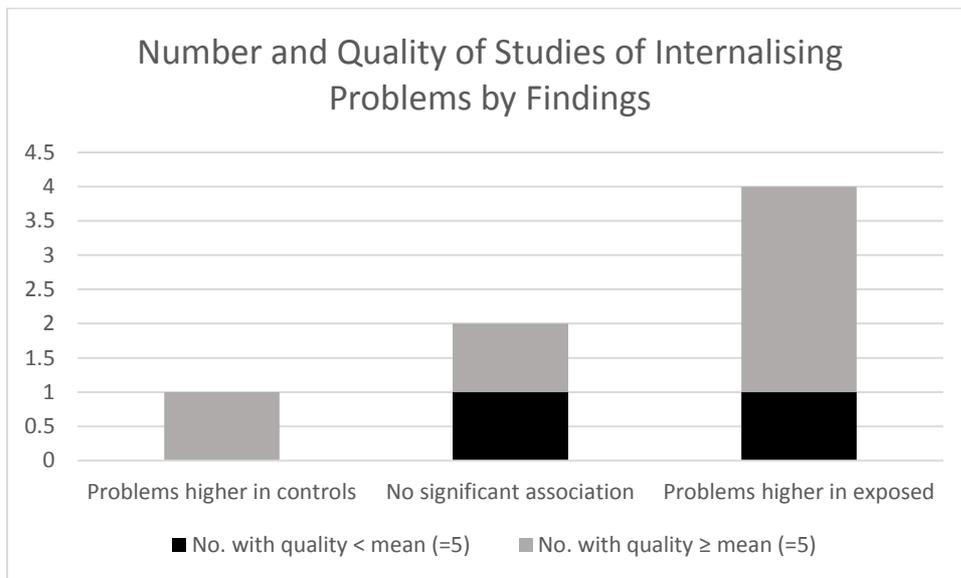


Figure 3: Number and Quality of Studies of Internalising Problems by Findings



**Tables of Results**

Legend for Tables: Abbreviations Used	
•	DICA = Diagnostic Interview for Children and Adolescents
•	SDQ = Strengths and Difficulties Questionnaire
•	CBCL = Child Behaviour Checklist
•	YSR = Youth Self Report
•	PTSD = Post Traumatic Stress Disorder
•	OR = Odds Ratio
•	PR = Prevalence Ratio
•	CI = Confidence Interval

*Table 1: Study Characteristics and Summary of Main Results Grouped by Outcome Measured*

Study characteristics					Results by outcome measured		
Author (Year)	Location	Sample size, age range, and method	Quality score (out of 10)	Outcome measurement method	Total psychopathology	Externalising problems	Internalising problems
<b>Al Gamal et al (2013)</b>	Jordan	4008 (2093 non working school children, 896 working school children, 1019 working non schooled children). 6-16 years. 30 schools randomly selected, and school counselors/working children asked to identify and invite other working	7	SDQ. Completed by children as a questionnaire with supervision by a researcher for children aged 14-16 and the items read to them for children aged 6-13 years.	Non working school children had a higher mean score (M=12.7, SD=5.7) than working school children (M=12.2, SD=5.6) and than working and non schooled children (M=11.4, SD=5.3). ANOVA showed the difference was significant - $F(2,3314)=3.59$ , $p=0.28$ . Post hoc comparison (Scheffe test) showed the difference was between working school children and working non		

		children. Self identification also “pursued” for working children, and convenience sampling.			schooled children.		
<b>Alem et al (2006)</b>	Addis Ababa, Nazareth, Awassa, Bahirdar – Ethiopia	2400 (2000 child labourers, 400 non-labourer children). 8-15 years. Systematic and purposive sampling.	6	DICA administered to those who screened positive using RQC. Completed by children as an interview.	DICA: Mental health disorders significantly more common in non-labourers. Labourers 4.9%, non-labourers 8.8% (p=0.002). OR = 1.86 (95% CI = 1.24, 2.77).		Separation anxiety area of DICA. No significant difference; labourers 0.4%, non-labourers 0.5% (p=0.651). Phobia area of DICA. Significantly higher in non-labourers; labourers 3.1%, non-labourers 5.3% (p=0.036). Enuresis area of DICA. No significant difference; labourers 1.0%, non-labourers 1.0%, (p=1.000) Encopresis area of DICA. No significant difference; labourers 0%, non-labourers 0.3% (p=1.000)
<b>Benvegnu et al (2005)</b>	Pelotas, Brazil	3139 (474 workers, 2665 non-labourer children). 10-17 years. Randomly selected 22 census sectors from low-income areas and interviewed all children within this age group “living in households in these sectors”.	6	CBCL. Completed by parents/caretakers as an interview.	In 14-17 year olds, prevalence was 12.8% in non workers and 9.5% in workers (p=0.05). Adjusted prevalence ratio 0.6 (95% CI 0.4-1.0, p=0.042). In 10-13 year olds, prevalence was 15.0% in non-workers and 21.4% in workers (p=0.041). Adjusted prevalence ratio 1.3 (95% CI 0.9-1.9, p=0.228). When comparing the 2 age groups, the prevalence ratio (adjusted) was 2.7 (higher in the 10-13 year old group),		

					95% CI 1.4-5.1, p=0.003.		
<b>Bordin et al (2013)</b>	Embu, Brazil	212. 9-13 years. One mother-child pair selected from all eligible households in 24 randomly selected clusters.	6	CBCL. Completed by mothers as an interview.	9.5% of the 21 children with internalising and externalising problems had worked, whereas 90.5% of the 21 children had not. OR=2.0 (95% CI 0.39-10.35, p=0.332)	9.1% of the 11 children with pure internalising problems had been exposed to work, whereas 90.9% of them had not. OR=1.90 (95% CI=0.21-17.01, p=0.462)	17.1% of the 41 children with pure internalising problems had been exposed to work, whereas 82.9% of them had not. Children exposed to work were found to be significantly more likely to present with pure internalising problems, OR=3.91 (95% CI=1.29-11.91, p=0.011). In the presence of social isolation and family SES, adjusted OR=3.7, 95% CI =1.2-11.8, p=0.027.
<b>Catani et al (2009)</b>	Kabul, Afghanistan	287 (48.7% of boys working, 29% of girls working). 7-15 years. Entire classes were chosen randomly from schools selected based on safety conditions.	3	University of California at Los Angeles PTSD Index for children, with some clinician administered testing for some children as well. Completed by children as a structured interview.			Correlation between hours of forced work/day and PTSD symptom score in boys was 0.02 (not significant - p≥0.05), in girls was 0.27 (not significant - p≥0.05).
<b>De Baessa (2008)</b>	Guatemala	86 (43 working, 43 non working). 11-16 years. Working children identified as a convenience sample, control children selected at random from the population of low	2	Child Depression Inventory. Coopersmith Self Esteem Inventory. Completed by children as an interview.			Depression: Total scale (mean) score was 12.30 in the working group (SD 7.68) and 10.05 in the non working group (SD 5.74), p=0.054. Self Esteem: No significant difference. Total self esteem score (mean) was 56.79 in the working group

		socioeconomic status children from a public school for boys and a private school for girls.					(SD 11.79) and 57.58 in the non working group, p=0.646. The negative self-esteem sub scale of the Child Depression Inventory did, however, show a significant difference with a mean score of 2.33 in the working group (SD 1.54) and 1.49 in the non working group (SD=1.16), p=0.002.
<b>Fekadu et al (2006)</b>	Addis Ababa, Ethiopia	1000 (528 child labourers and 472 non economically active controls). 5-15 years. Key informants used to identify labourers, as well as a survey in some areas and convenience sampling. Non-labourers were selected from schools using a random table method.	6	DICA. Completed by children as an interview.	Labourers 20.1%, non-labourers 12.5% (p=0.0001), OR=1.89 (95% CI 1.34, 2.67). Adjusted OR (sociodemographic factors, parental factors)=5.87 (95% CI 1.94, 17.77, p=0.002). After adjusting for sociodemographic (age, gender, religion, time of school attendance, orphan status, child labour status) and parental (educational level, mental illness, internal migration, marital and work status) factors, work was the only significant factor determining DSM-III-R diagnosis (adjusted OR 1.65, confidence interval not shown) although child labourers reported more stressors.	Disruptive behaviour disorder. No significant difference. Labourers 1.3%, non labourers 0.6% (p NS). OR=2.34, 95% CI 0.55-11.44. Substance abuse section. No significant difference. Labourers 0.9%, non labourers 0%. No further statistical calculation presented.	Anxiety disorders: labourers 5.9%, non-labourers 2.5% (p=0.003). OR=2.63 (95% CI 1.29-5.46). Separation anxiety area of DICA. Labourers 4.7%, non-labourers 1.5% (p=0.001). OR=3.64 (95% CI 1.49-9.27). Elimination disorders area of DICA. No significant difference. Labourers 9.2%, non-labourers 9.3% (p NS). OR = 1.12, 95% CI 0.72-1.73. Mood disorder. Labourers 4.9%, non labourers 0.8% (p=0.0001). OR=6.65 (95% CI 2.20-22.52)
<b>Hesketh et al (2012)</b>	India (Tamil Nadu, Kerala,	1400 (700 domestic workers and 700 school-	3	Study developed its own questionnaire about psychosocial wellbeing	"I have trouble concentrating" India: CDWs 36%, controls 31%, p value		

	<p>Maharashtra , Andhra Pradesh, Uttar Pradesh and Bihar) and the Philippines (Manila, Batangas, Bicolod, Cebu, Davao, Dumaguete and Iloilo).</p>	<p>attending, non working controls). Age range not specifically stated but from &lt;12 to 18 years. Child domestic workers were identified by local non-governmental organisations and snowballing techniques. Controls were identified from local schools.</p>		<p>based on qualitative work done by Woodhead on child labourers. Completed mostly as a questionnaire by control group children, and as a face-to-face interview for child domestic workers.</p>	<p>0.09. Philippines: CDWs 44%, controls 34% , p value 0.04. "I feel a lot of stress" India: CDWs 55%, controls 22%, p value &lt;0.001. Philippines: CDWs 71%, controls 52%, p value 0.0001.</p>		
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<b>Kiran et al (2007)</b>	Zonguldak, Turkey	860, after exclusions due to missing data 726 (157 working, 569 not working). 14-20 years. "Schools were randomly chosen by a local education contact person and authors. The classes were stratified according to level then each class were accepted as a cluster and randomly selected".	8	Youth Self Report. Completed by children as a questionnaire with supervision from interviewers.	68.2 mean score in labourers, 66.0 in non-labourers, $p=0.018$ . OR=4.2 (95% CI 1.8-9.9, $p=0.001$ ). ORs are adjusted for gender, age, type of school, working status of mother, father and adolescents, father and mother's educational level	Externalising problems: 60.8 mean score in those working, 56.7 in those not working ( $p=0.114$ ). OR=2.4 (95% CI 1.1-5.3, $p=0.035$ ). Attention problems. Mean score 62.4 in those working, 62.5 in those not working ( $p=0.896$ ). OR=2.4 (95% CI 1.1-5.50, $p=0.027$ ) Delinquent behaviours. Mean score 63.5 in those working, 60.7 in those not working ( $p=0.000$ ) Aggressive behaviours. Mean score 56.9 in those working, 56.5 in those not working ( $p=0.430$ ).	'Anxious/Depressed' score. 64.1 mean score in those working, 61.6 in those not working ( $p=0.003$ ). OR=1.8 (95% CI 0.90-3.71, $p=0.116$ ). Internalising problems area of YSR: 66.2 mean score in those working, 63.5 in those not working ( $p=0.002$ . OR = 2.4 (95% CI 1.1-5.2, $p=0.027$ ). Withdrawn: 66.8 mean score in those working, 65.6 in those not working ( $p=0.151$ ). OR=2.8 (95% CI 1.3-6.0, $p=0.007$ ). Somatic complaints: 63.2 mean score in those working, 58.9 in those not working ( $p=0.000$ ). Social problems: 57.9 mean score in those working, 55.6 mean score in those not working ( $p=0.001$ ). Thought problems: 67.3 mean score in those working, 66.4 in those not working ( $p=0.303$ ). OR=2.99 (95% CI =1.91-4.69, $p=0.000$ )
<b>Maciel et al (2013)</b>	Sao Paulo, Brazil	191 (126 working on the streets, 65 siblings who did not work on the streets). 7-14 years.	6	SDQ. Completed by primary caregiver.	Significantly higher % of abnormal results among working children (71.4% vs 28.6%, $p=0.041$ ).		

		Families were identified by a non-governmental organization which “develops interventions to restructure families at high social risk and to eliminate child labour”					
<b>Nuwayhid et al (2005)</b>	Tripoli, Saida, and Beirut, Lebanon	138 (78 working full time, 60 non working children). 10-17 years, boys only. 10-17 year old boys working in industrial shops were identified from a list of working children enrolled in a training programme with a non-governmental organization running training programmes. Controls were a volunteer convenience sample.	5	Children’s Manifest Anxiety Questionnaire. Hopelessness Scale for Children. Self-Esteem Inventory. Completed by children.			Anxiety: % scoring $\geq 18$ was 25.3% in those working and 14.9% in those not working (fully adjusted OR 0.76, 95% CI 0.08-7.03). Mean score 12.9 in those working, 11.5 in those not working (p=0.60). Hopelessness: Score of $>8.0$ was present in 22.1% of those working and 12.2% of those not working (adjusted OR 0.33, 95% CI 0.05-2.48, p=0.93). Mean score was 6.1 in those working and 5.6 in those not working. Self-Esteem: Score of $\leq 14$ was present in 23.5% of those working and 14.0% of those not working (adjusted OR 1.18, 95% CI 0.26-5.40). Mean score was 17.5 in those working and 18.5 in those not working (p=0.59).

<b>Zinn-Souza et al (2008)</b>	Sao Paulo, Brazil	724 (44.8% currently working, 32.3% never worked, 22.9% unemployed for at least the past 3 months). 14-18 years. All students from a public school were surveyed.	5	Patient Health Questionnaire (depression module). Children completed the questionnaire.			Depression symptoms present in 6.0% of those not working, 7.4% of those working (p=0.378, OR=0.74 95% CI 0.38-1.44), 9.6% of those unemployed (p=0.170, OR=0.59, 95% CI 0.28-1.25)
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Table 2: 'Risk Factors' Studied and their Effect, Where Reported

Author and Year	What work was studied?	Work intensity	Reasons for working	Associations
Alem et al (2006)	Majority of girls (76%) were engaged in domestic labour, the majority of boys in other types of labour (not specified)	Not reported		Domestic labourers reported difficulty in getting on with other people more often (2.5%) than the non laborers (0.3%) (P= 0.006 ).
Al Gamal et al (2013)	253 (26.5%) children were working in vehicle repair, 199 (20.9%) were working in service, 100 (10.5%) were street workers, and 13 (1.4%) were working in agriculture.	Mean number of working hours was 42.9 per week.		None reported

<b>Benvegna et al (2005)</b>	The majority of workers (33%) worked in retail, followed by those performing non-domestic services (27%). Major occupations for this last group included stonemason assistant, assistant in restaurants and grocery stores, seller, yard cleaner, nanny, and maid.	Not asked	Not asked	Adolescents who began to work before age 10 years showed a 4.4-fold risk of behavioural problems (CI 1.7–11.0) and those who began between ages 10 and 13 years showed a 3-fold risk (CI 1.4–6.5) when compared with those who began to work after age 14. Adolescents who worked in non-domestic services showed a 60% lower prevalence of behavioural problems than those who did not work (CI 0.1–1.1)
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Bordin et al (2013)	Wide range. 58.8% commerce related helping in shops), 5.9% babysitting, 5.9% selling cans for recycling, 5.9% painting refrigerator magnets, 5.9% fare collection on transport vehicles, 5.9% car painter helper in father's shop, 5.9% flyer distribution, 5.9% 'a variety of small jobs'.	Children who worked for a longer period of time (9–36 consecutive months) (24.4%) worked for 4 to 38 hours per week. Children who worked 20–70 hours per week (58.8%) did that for less than a month to 12 consecutive months maximum.	Getting money for personal expenditures (41.2%), the pleasure obtained with the work activity (23.5%), helping the mother or father in their work (11.8%), the need of increasing family income (5.9%), and avoiding being alone (5.9%).	Children with internalizing problems alone or in combination with externalizing problems had worked for a greater number of hours during lifetime than children without internalizing problems (Mann-Whitney U test: $P = 0.046$ ).
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<b>Catani et al (2009)</b>	The majority of children who reported working held jobs as carpet weavers. Seven boys also reported working in small retail stores.	On average, children forced to contribute to the family's income generation worked 6.7 hours/day (SD=3.01) with a range of 1–13 hours/day. In children affected by child labour, there was no significant difference between genders with respect to the average amount of daily work (M boys: 6.6, SD = 2.9, M girls: 6.7, SD = 3.1).	Not asked	None reported
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<b>De Baessa (2008)</b>			The majority of children contributed income to their families (82%) and kept some money for themselves (62%). Only 6% felt they were treated unfairly at work.	
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<b>Fekadu et al (2006)</b>	Street vending, working in shops or hotels, handicrafts	Over 50% of these child labourers work for more than 8 hours daily.	Not asked	None reported
<b>Hesketh et al (2012)</b>	Domestic work	<ul style="list-style-type: none"> <li>• Day off India: 8.6%, Philippines 51%</li> <li>• Hours of work/day &lt;6 - India 1.6%, Philippines 26%; 7–9 hours - India 54%, Philippines 20%; 10–12 hours - India 43%, Philippines 15%; &gt;12 hours - India 3%, Philippines 20%</li> </ul>	<ul style="list-style-type: none"> <li>• Poverty: India 39%, Philippines 14%</li> <li>• To continue studies: India 15%, Philippines 47%</li> <li>• Parents decided: India 22%, Philippines 27%</li> <li>• Loan repayment: India 8.5%, Philippines 0%</li> <li>• Not known: India 15%, Philippines 12%</li> </ul>	<ul style="list-style-type: none"> <li>• Not having a day off: India OR 0.52 (0.41 to 0.64) p&lt;0.0001, Philippines OR 0.9 (0.6 to 1.4), p=0.5</li> <li>• Working &gt;10 h/day: India OR 1.7 (1.5 to 1.9) p&lt;0.0001, Philippines OR 1.2 (1.1 to 1.5) p=0.02</li> </ul>

<b>Kiran et al (2007)</b>		<ul style="list-style-type: none"><li>• 3.2% <math>\leq 15</math> hours</li><li>• 18.5% 16-40 hours<ul style="list-style-type: none"><li>• 78.3% <math>\geq 41</math> hours per week</li></ul></li></ul>		<ul style="list-style-type: none"><li>• None reported</li></ul>
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<b>Maciel et al (2013)</b>	32% sold products at crossroads (gum, candies, cleaning cloths); 30% collected cans and other materials for recycling; and 20% juggled. Other activities were cleaning windshields, begging, and monitoring parked cars			None reported
<b>Nuwayhid et al (2005)</b>	<ul style="list-style-type: none"> <li>• Carpentry 24.7%</li> <li>• Mechanics 28.6%</li> <li>• Metal works 35.1%</li> <li>• Other 11.7%</li> </ul>		(Use of salary) <ul style="list-style-type: none"> <li>• Family basic needs 64.4%</li> <li>• Amusement 15.1%</li> <li>• Combination of above 20.5%</li> </ul>	None reported

<b>Zinn-Souza et al (2008)</b>	Workplace features, stressors, tasks asked but not fully reported		Asked but not reported	Adequate workplace lighting associated with depression (OR=5.68, 95% CI 2.05;15.73). Difficulty concentrating at work not associated with depression (OR=3.86 95% CI 0.99;15.05)
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