Review article

Health issues affecting female internal migrant workers: A systematic review

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Abstract

Background

Economic contribution by internal migrant workers, in particular the workers in Export Processing Zones (EPZ) in Sri Lanka, is well recognized, yet the social and health consequences are unknown.

Objective

To systematically review the health issues affecting female internal migrant workers in EPZ in Sri Lanka

Methods

A literature review was conducted through electronic databases and hand searches of grey literature. Studies eligible for inclusion were those reported health or social issues among females employed in an industry within EPZ from 1978 to 2012. Studies were selected using a defined checklist for their methodological quality and in relation to measurement of health status.

Results

Of the 550 studies identified, eight publications were included for the review. The respondents were relatively young and educated females, and the large majority have migrated predominantly from rural areas to work in garment factories located in urban centers. These studies described health issues related to nutrition, reproductive health, mental health, musculo-skeletal disorders and gender issues. The review identified high prevalence of nutritional deficiencies such as underweight and anaemia; risky sexual behavior; and psychological disorders among female factory workers. Migrant workers had higher prevalence of anaemia and psychological depression than their non-migrant counterparts. As a positive effect, women experienced empowerment through gaining income and new knowledge.

Conclusions

Female migrant workers generally tend to exhibit some disadvantage due to health risks, and are more likely to be subject to ill-health than non-migrants. More rigorous research is needed to determine true health impacts within this population.

Key words

Health impact; health risks; internal migrants; garment factory workers; Export Processing Zones

Introduction

The United Nations defines internal migration as a permanent change in residence from one geographical unit to another within a particular country (1). Internal migration has profound effects on health and wellbeing of an individual or a population (2-6). In Sri Lanka, several categories of internal migrants can be identified, such as labour migrants, students, seasonal workers, internally displaced persons, and armed forces personnel (7). Among the labour migrants, the internal migrant workers in Export Processing Zones (EPZ) constitute an important sub-group mainly due to their significant contribution to economic development of the country.

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DOI: 10.4038/jccpsl.v21i1.8080

Sri Lanka's first EPZ was established in 1978 in Katunayake, a northern suburb of Colombo, as a part of the economic liberalization policy aiming to accelerate economic growth (8,9). The majority of the enterprises were textile and ready-made garment industries which attracted large number of young rural women from economically marginalized families to work as machine operators. Subsequently, these industries were extended to other regions of the country, and there were six EPZ and two industrial parks by year 2000, and as at present there are 12 in total (10). Since the liberalization of economy, there was a progressive growth in per-capita gross domestic product from US$ 281 in 1975 to US$ 2400 by 2010 (11,12). The garments and textile sector forms the largest industrial employer, and remains as the second highest contributor to the nation's foreign exchange. The garments and textile exports contributed to 40% (US$ 4.2 billion) of the total exports income of Sri Lanka in 2011 (10,12). According to the Board of Investment Sri Lanka (BOI), there were 128,267 employees in the EPZ by October 2012, and the majority (59%) of them were females (13). This population makes a major contribution to the economy since it constitutes a substantial fraction of the garment industry workforce in Sri Lanka (10).

Health and social issues of internal migrant workers have been highlighted from different parts of the world including China, Bangladesh, Nepal, Thailand, Cambodia, and Mexico (14-21). High prevalence of nutritional deficiencies such as anaemia, and Vitamin A and D deficiencies were found among female garment factory workers in Dhaka, Bangladesh (14,15). Risky sexual behavior, sexual harassment and violence against women were reported in Nepal and Thailand (17,18,21). Sri Lankan literature indicated that factory workers in EPZ had experienced greater health risks and many adverse health outcomes (22-27). Most of the Sri Lankan studies have focused on females with the assumption by many researchers and institutions that vulnerabilities are higher in this group.

The economic contribution by internal migrant workers, in particular the workers in EPZ, is well recognized, yet the social and health consequences are unknown. There has been no attempt to identify through a detailed review process the health impacts of such workers, despite the long history and existence of these workers. High quality evidence is required to make an organized effort to ensure optimum health of this important internal migrant group. The objective of this systematic review is to examine the health issues affecting female internal migrant workers in EPZ in Sri Lanka. Further, the review attempts to investigate the hypothesis that there are differences in the health status of migrant workers compared to their non-migrant counterparts.

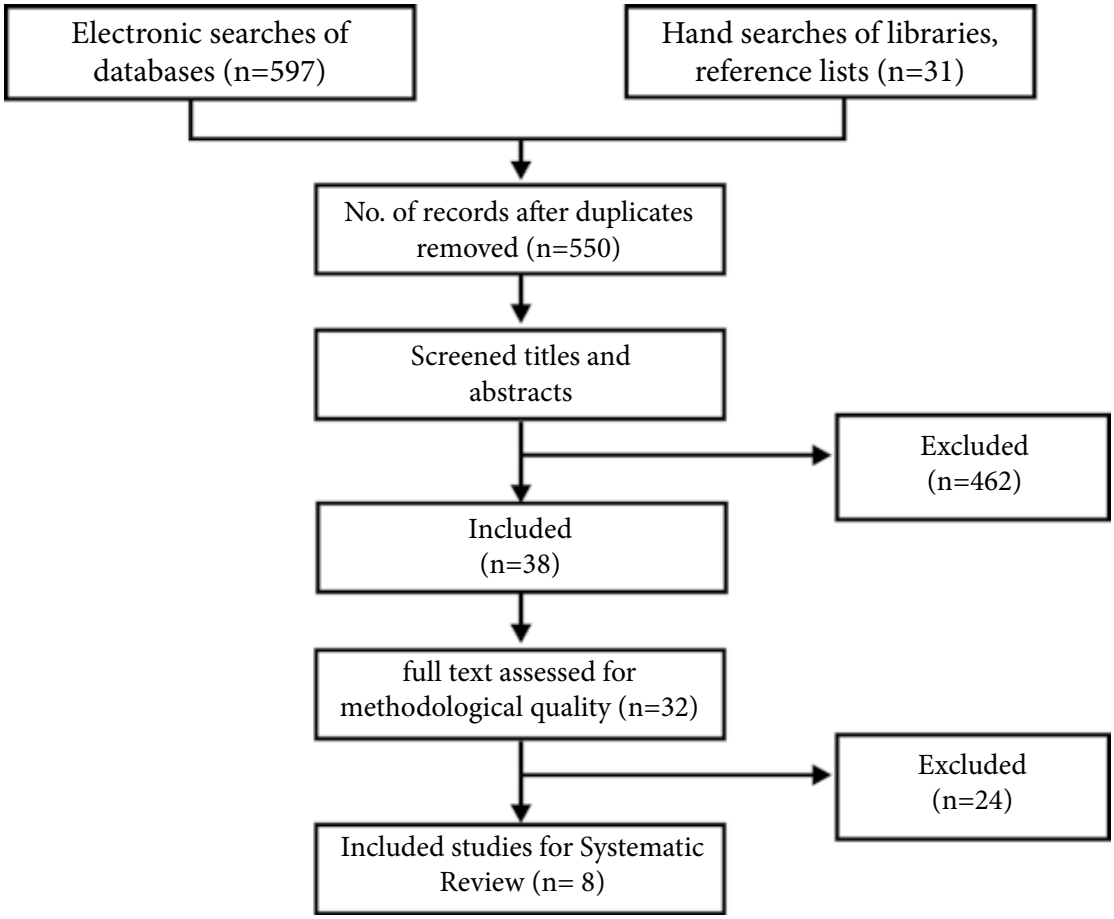
Methods

The review process, as illustrated in Figure 1, followed a step-wise approach in the following order: developing a search strategy; defining the selection criteria; assessment for methodological quality; and data extraction and summarization.

We undertook electronic searches of relevant databases and hand searches of grey literature from libraries of selected academic and research institutions. Electronic databases searched comprised MEDLINE through PubMed, HINARI, Web of Science and Google Scholar. The search strategy consisted of a combination of three search strings: terms related to health status; terms for study participants; and terms for work setting. Search terms included Medical Subject Headings (MeSH) and free text in following combinations: "health", "disease", "disorder", "illness" and "female", "internal migrant", "workers" and "factories", "export processing", "free trade zone". In addition, the

reference lists of all retrieved publications were checked for eligible studies. Searches were restricted to papers published in English since January 1978 to November 2012.

Figure 1. Flow diagram of study selection for the review



Selection of studies was based on three inclusion criteria: (i) the reported outcome was either a health issue or health-related social issue; (ii) primary study participants were females employed in an industry; (iii) study was conducted within a EPZ in Sri Lanka. We excluded articles that were based on personal opinion without any supportive data, ethnographic/qualitative studies and undergraduate level research reports, but included technical reports, and theses or dissertations accepted as a requirement for postgraduate qualification. Abstracts and titles were reviewed by the investigators, and then decided whether to obtain the full text for assessment of methodological quality.

The methodological quality was assessed by means of a checklist, which was developed by the investigators for the purpose of the study. The checklist comprised 12 items including use of clearly defined eligibility criteria for enrollment of participants, scientifically valid sampling technique, adequate number of participants, standardized procedure or tools to assess outcome variables etc. Two investigators independently rated the items in the checklist, and marked as positive, negative or uncertain. Evidence was graded into 3 levels based on the percentage of positively rated items: poor quality (<60%); satisfactory quality (60-79%); and high quality (≥80%). Only the "satisfactory" and "high" quality studies were included in the final review.

Table 1. Characteristics of the publications included in the systematic review, according to health issues

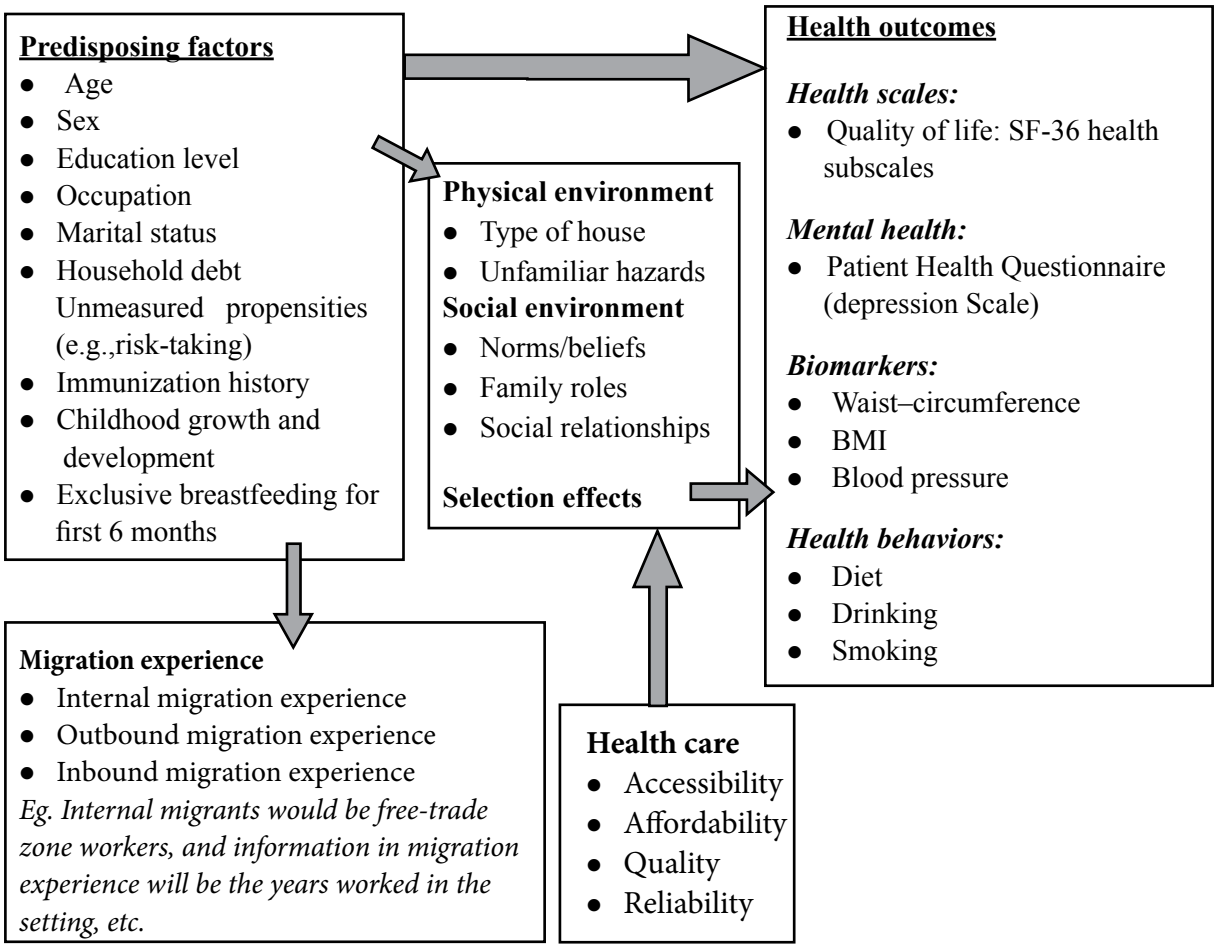
Main theme	Author (reference number) (publication type)	Study Population	Sample size
Nutrition	Amarasinghe, 2004 (28) (Master's dissertation)	Garment industry females workers in Free Trade Zone[a] Katunayake	n=652
Reproductive Health	Hettiarachchy & Schensul, 2001(24) (Journal article)	Young Unmarried women in Free Trade Zone Katunayake	n=775
Reproductive Health	Perera, 2004 (32) (Journal article)	Female migrant workers in Export Processing Zone Katunayake	n=400
Mental Health	Samarasinghe & Ismail, 2000 (26) (Research Report)	Female blue collar workers Export Processing Zones of Katunayake, Biyagama, Rathmalana, Koggala, Pallekele	n=1000
Mental Health	Pallewatta, 2005 (31) (Doctoral thesis)	Female workers in Free Trade Zone Katunayake	n=1630
Musculo-skeletal disorder	Amarasinghe, 2012 (29) (Doctoral thesis)	Female garment workers Export Processing Zone Biyagama	n=1083
Musculo-skeletal disorder	Lombardo et al, 2012 (25) (Journal article)	female garment factory workers in Free Trade Zone Kogalla	n=1058
Gender issues	Hancock et al, 2011 (30) (Research Report)	Women worked in factories in Export Processing Zones in Sri Lanka	n=2304

"a" the terms 'Free Trade Zone' and 'Export Processing Zone' were interchangeably used in the studies.

As listed in Table 1, eight publications were included for the final review (24-26, 28-32). These comprise 3 journal articles (2 indexed and 1 non-indexed), 3 postgraduate research publications (2 doctoral theses and 1 master's dissertations) and 2 research reports. All these studies were cross-sectional in nature, however 2 studies included case-control designs nested within them. We adapted a conceptual framework to extract data and identify evidence for health outcomes, predisposing factors, physical environment, migration experience,

and health care in each study (figure 2) (33). Four studies have compared health outcomes between migrant and non-migrant workers or tested an association between migration and health outcomes.

Figure 2: Conceptual framework for the types of evidence on health status that could be gathered from studies that assessed health status of migrants and mobile populations



Results

The study participants were females and the majority, i.e., more than two-thirds, aged below 30 years. The mean age varied between 23.0 to 30.7 years in the studies which reported mean age (25,26,29-32). The percentage unmarried ranged from 63% to 88% (26,28-32). Overall, the majority has passed GCE ordinary level, and in three studies this percentage was more than 84% (25,30,32). In five studies, the majority of participants ranging from 59% to 100% were migrant workers (26,28-32). In contrast, one study conducted in Koggala EPZ reported a lower percentage of migrant workers, amounting to 15% (25). Two studies did not present the migration status in measureable terms (24,30).

Findings related to health and social issues were grouped according to 5 broad themes: (i) Nutrition; (ii) Reproductive health; (iii) Mental health; (iv) Musculo-skeletal disorders; and (v) Gender issues. The overall findings are summarized in Table 2. The differences in selected health and social outcomes between migrant and non-migrant female factory workers are highlighted in Table 3.

Table 2 Health issues affecting female internal migrant workers: Key findings of studies included in the systematic review

Study	Problem Category	Indicator	Value
Amarasinghe (2004)[28]	Under nutrition	Underweight (BMI <18.5)	34.2%
		Normal (BMI 18.5-24.9)	52.0%
		Overweight (BMI 25.0-29.9)	11.9%
		Obesity (BMI ≥30)	1.9%
	Anaemia	Anaemia (Hb <12 g/dl)	44.7%
		Mean Hemoglobin (g/dl)	11.4 (±1.6)
		Iron store depletion (Serum Ferritin <12 μg/l)	66.6%
Perera (2004)[32]	Knowledge on reproductive health	Knowledge to protect unwanted pregnancy	74.5%
		Correctly recognized fertile period in menstrual cycle	20.0%
		Awareness about HIV/AIDS	90.0%
		Awareness of other Sexually Transmitted Diseases	<20.0%
	Attitudes on reproductive health	What do peers normally do if they get pregnant through pre-marital sex?	
		Induced abortion	72.3%
		Commit suicide	24.4%
		Return home and bring up child	14.2%
		Abandon baby	12.7%
Hettiarachchy & Schensul (2001)[24]	Risky sexual behaviour	Having a friend with risky sexual behavior	29.5%
		Having any risky sexual behavior	16%
		Sexual relationship	12.8%
		Getting pregnancy	2.7%
		Having an abortion	1.4%
		Having penetrative sex	2.6%
		Oral sex	0.9%
		Having relationship with a married man	2.6%
Pallewatta (2005)[31]	Psycho-somatic problems	Prevalence of chronic fatigue	23.5%
		Prevalence of common mental disorders	23.2%

Study	Problem Category	Indicator	Value
Samarasinghe & Ismail (2000)[26]	Psychological distress	mean score (±SD)	9.13 (±5.15)
		Somatic scale	7.13 (±5.31)
		Anxiety Scale	6.49 (±3.33)
		Social dysfunction scale	3.90 (4.32)
		Depression scale	3.90 (±4.32
Amarasinghe (2012)[29]	Musculo-skeletal disorders	Prevalence of work-related neck and upper limb musculo-skeletal disorder	54.9%
		Site of pain	
		Neck	29.3%
		Shoulder	38..5%
		elbow	22.1%
		Wrist	4.1%
		Specific work-related syndrommes	0.7% to 24%
Lombardo (2012)[25]	Musculo-skeletal disorders	Prevalence of musculoskeletal symptoms(occurring more than 3 times or lasting a week or more during the previous 12-month period)	15.5%
		The most common site of pain	
		Back	57.3%
		Knee	31.7%
	Under nutrition	Underweight (BMI <18.5)	28.1%
Hancock (2011)[30]	Empowerment	participated more in home decision making	55.8%

Nutrition

Body Mass Index (BMI) of female factory workers were examined in two studies (25, 28). In 2004, a study by Amarasinghe among 640 female workers in a Garment sector at Katunayake EPZ estimated the prevalence of underweight (BMI <18.5 Kg/m2) at 34.2% (28). The number of underweight subjects was further disaggregated according to the international classification by World Health Organization (34), and the prevalence of mild, moderate and severe thinness was found to be 17%, 12% and 5% respectively. According to a more recent study in Koggala EPZ the prevalence of underweight in female garment factory workers was 28% (25). Amarasinghe also investigated heamoglobin and serum ferritin and found that 45% of female workers were anaemic (haemoglobin <12 g/dl) (28). Almost two-thirds (67%) found to have low serum ferritin levels (serum ferritin <12 µg/l) indicating iron store depletion. As shown in Table 3, the prevalence of anaemia was significantly higher among those who migrated from rural areas (51%) than those staying their own homes (35%).

Table 3 Differences in the health status between female migrant workers and female non-migrant workers in Export Processing Zones in Sri Lanka

Study	Study population	Indicator/s	Migrant workers	Non-migran workers	Significance for the difference or Association
Amarasinghe (2004)[28]	Garment industry females workers in Free Trade Zone Katunayake	Prevalence of Anaemia (% with Haemoglobin <12 g/dl)	50.7%	34.9%	P<0.05
Samarasinghe & Ismail (2000)[26]	Female blue collar workers Export Processing Zones of Katunayake, Biyagama, Rathmalana, Koggala, Pallekele	Mean Score:			
		Somatic Scale	9.19	8.34	NS
		Anxiety Scale	7.18	6.45	NS
		Social Dysfunction Scale	6.43	6.93	NS
		Depression scale	4.01	2.41	P<0.01
Pallewatta (2005)[31]	Female workers in Free Trade Zone Katunayake	Odds ratio of having chronic fatigue in a migrant worker in contrast to non-migrant worker	OR (95%CI) = 0.51 (0.18,1.52	Contrast group	NS
Amarasinghe (2012)[29]	Female garment workers Export Processing Zone Biyagama	Odds ratio of having neck and upper limb musculoskeletal disorder in a migrant worker in contrast to a non-migrant worker	OR =1.0	Contrast group	NS

NS=Not significant
OR (95%CI)=Odds Ratio (95% Confidence Interval)

Reproductive health

In this systematic review, we found two studies investigating issues pertaining to reproductive health (24,32). A study conducted in Katunayake EPZ in 2001 highlighted that young, unmarried women migrating from poor rural villages to EPZs, were at a higher risk for unprotected pre-marital sex and unwanted pregnancy. Of the 775 women, 30% disclosed that their female friends in the zone were often involved in risky sexual behavior. Of the respondents, 16% stated that they themselves were involved

in the following risky sexual behavior: sexual relationship (13%); oral sex (1%); relationship with a married man (3%); penetrative sex (3%); getting pregnant (3%); and having an abortion (1.4%). Another study, reported that the majority of female migrant workers in Katunayake EPZ had knowledge to protect unwanted pregnancy (75%), and awareness about HIV/AIDS (90%) (32). However, only 20% could correctly recognize the fertile period in the menstrual cycle, and less than 20% were aware of the other sexually transmitted diseases.

Mental health

In the present review, there were 2 studies which focused on mental health status of female factory workers (26,31). Using a validated General Health Questionnaire (GHQ-28), Samarasinghe and Ismail assessed psychological distress among 1000 female blue collar workers in 5 EPZs in 2001 (26). The scores for the four sub-scales of psychological distress were as follows: "Somatic scale" relating to people's feelings of health and fatigue and providing a measure of bodily sensations (mean=9.13, SD=5.15); "Anxiety scale" includes items relating to anxiety and sleeplessness (mean=7.13, SD=5.31); "Social Dysfunction scale" includes items relating to the extent to which a respondent is able to cope with the demands of work and the usual challenges of life (mean=6.49, SD=3.33); "Depression scale" includes items relating to depression and suicide (mean=3.90, SD=4.32). Table 3 shows that the mean depression score was significantly higher in migrant females (mean=4.01) than those who lived own home (mean=2.41). However, there were no significant differences in mean scores in the somatic, anxiety and social dysfunction scales between migrant and non-migrant groups.

The prevalence of chronic fatigue was estimated at 24% in a study conducted by Pallewatta in Katunayake EPZ in 2005 (31). The results were based on a validated "Checklist of Individual Strength" questionnaire among 1630 female workers. The common mental disorders were found in 23% of female workers according to the General Health Questioannaire-30 (GHQ-30), a 30-item tool validated previously in Sri Lanka (31,35). A case-control design nested within this study investigated the predictors of chronic fatigue including the migrant status. The risk for chronic fatigue was significantly higher in women who were working overtime for 3 hours or more (OR=29.9), supporting family from their monthly earnings (OR=27.7); and not engaged in leisure time activities (OR=10.2). As shown in Table 3, there was no significant association between migration status and chronic fatigue (OR=0.51, 95%CI 0.18-1.52), though the percentage of migrant workers was lower in cases (87%) than controls (93%).

Musculo-skeletal disorders

Two cross-sectional studies, with sample size exceeding 1000 in each, described musculoskeletal disorders in female garment factory workers (25, 29). One study conducted in Biyagama EPZ revealed that prevalence of work-related neck and upper limb musculo-skeletal disorders was 55% (29). Percentage of migrant workers was almost equal in cases (56%) and controls (56%) with an Odds Ratio of 1.0, indicating no association between migrant status and musculo-skeletal disorders in this population. In contrast, the study from Koggala EPZ, a rural area in Southern Province showed a lower prevalence of musculoskeletal disorders (25). For example, symptoms occurring more than 3 times or lasting a week or more during the previous 12-month period was 16%. The most common sites of pain were back and knee in contrast to neck and shoulder in the former study.

Gender issues

A survey on gender empowerment sampled 2304 women between 2008-2011 who worked

in factories in Sri Lanka's EPZ (30). The survey found that either explicitly or implicitly the women experienced empowerment in many ways for example, through gaining new knowledge, earning income, financial contributions to their family, increased decision making etc. The common dis-empowering factors included public humiliation and harassment associated with the EPZs, and sexual harassment in public and the workplace. Main strength of this study was the combination of quantitative and qualitative data that provided empirical and 'generalisable' results that are valid and rigorous. According to the study from Koggala EPZ only 0.5% reported having been subjected to emotional abuse, and none of the workers reported any sexual or physical abuse at work during last 12 months (25).

Discussion

According to the selected studies, the respondents were relatively young and educated females, and the large majority have migrated from rural areas to work predominantly in garment factories. The review identified high prevalence of underweight and anaemia, risky sexual behavior, psychological disorders and musculo-skeletal disorders, and as a positive effect, empowerment through gaining income and new knowledge.

Despite many potential nutritional challenges in young females in Sri Lanka, only few dimensions of nutritional status have been described in studies selected for this review (36,37). Iron deficiency anemia, known as one of the strongest predictors for low productivity and adverse reproductive outcomes, was prevalent among women in the EPZs. The strength of this study lies with the comparison of anaemia between migrant and non-migrant populations highlighting that migrant workers were more affected than non-migrants. It is also noteworthy to observe that the prevalence of anaemia was higher in EPZ (45%) than the national estimate for women in the reproductive age group (32%) (38).

Reproductive health issues among female factory workers in Katunayake EPZ have been reported since early 80's, however these early studies did not fulfill the quality assessment criteria to be included in this review (27,39,40). One of the earliest surveys in 1983 indicated that there were higher number of unwanted pregnancies, life-threatening illegal abortions and sexually transmitted infections within the zone (39). The 2 studies on reproductive health in our review supported the fact that the young female factory workers experience risky sexual behaviours, though the rate was not so high. Authors speculated that the actual figures would be somewhat higher than the reported proportions due to the fact that young unmarried women under-report sexual activity. Findings were well supported with evidence of ethnographic studies too (22,41).

Our review identified some negative effects of migration on mental health status, in particularly on depression. These findings support speculations of a previous report that females in ready-made garment industries were under tremendous mental stress working in environs quite different to what they are used to, in more urban surroundings away from their villages (40).

Despite a number of studies on musculoskeletal disorders in different EPZs since 1980s, only 2 studies were eligible for this review due to methodological limitations (25,29,39,42,43). These 2 studies showed conflicting evidence probably due to contextual differences in the female workforce, ergonomics, and access to occupational health services. The prevalence of musculo-skeletal disorders was higher (54% vs. 16%) in the setting which had higher proportion of migrant workers (73% vs. 15%) (25,29). These differences mandate the need for further investigation for the effects of migration on musculo-skeletal disorders.

The phenomenon of young women migrating from their patriarchal home environment to

EPZs has evoked a new sub-culture which is distinct from both their own village setting and modernized urban society (41). Early studies reported that young women who came from outstations, and were out of parental control, would be easy victims of sexual exploitation (39). An ethnographic study discussed that young female factory workers experienced verbal and physical harassment at workplace and local society due to changing gender roles (22). In contrast, this systematic review highlighted some positive effects related to gender issues, that women experienced empowerment through gaining new knowledge, earning income, financial contributions to their family, and increased decision making. We also identified a number of health services within some EPZ under the purview of the BOI that ensured a safe and dignified workplace (7). Further, results from the study of Koggala EPZ also showed a very low incidence of gender-based violence. There could be many possible reasons for this situation: Zone located in a more rural setting; most (85%) workers living in their family homes; workers were more mature and educated; and action taken to prevent abuse and uplift status of women (25).

Despite long existence of migrant workers in EPZs in Sri Lanka, and a number of research conducted, only 8 studies with sufficient quality were identified for this review. Of them, only 4 studies analyzed the effects of migration through comparisons, and some of these comparisons did not use multivariate analyses to account for confounding effects. None of the studies included in this review has investigated environmental health issues pertaining to migrant workers in EPZ. It has been reported that overcrowding, poor ventilation and inadequate sanitation in boarding houses are common health problems (40). There is scarcity of publications on outbreaks of communicable diseases though these have been frequently reported in mass-media.

Despite these limitations, this systematic review provides useful evidence on key health issues affecting female migrant workers who constitute the largest proportion of the workforce in the garment and apparel sector, the nation's largest industrial employer. The review may also provide insights into strategic planning through a rights-based approach to create an enabling environment to ensure the health protection of workers, especially those that are female internal migrants.

In conclusion, we found evidence that female migrant workers generally tend to exhibit some disadvantage due to health risks, and are more likely to be subject to ill-health than their non-migrant counterparts. Whist more rigorous research is needed to empirically determine the true health impacts within this internal migrant population, the nation's efforts to enable health protection for internal migrant workers is paramount.

Key Points

- This systematic review identified high prevalence of nutritional deficiencies such as underweight and anaemia, risky sexual behavior, psychological disorders and musculo-skeletal disorders, among female factory workers, and as a positive effect, empowerment through gaining income and new knowledge.
- Female migrant workers are more likely to be subject to ill-health than their non-migrant counterparts, for example, higher prevalence of anaemia and psychological depression was found in migrant workers than their non-migrant counterparts.
- Internal migrant workers are mainly concentrated in the garment and apparel sector, which also forms the largest

industrial employer in Sri Lanka, and remains as the second highest contributor to the nation's foreign exchange Sri Lanka. More rigorous research is needed to empirically determine the true health impacts within this internal migrant population.

Funding

This work was supported by International Organization for Migration, Sri Lanka.

Acknowledgement

We wish to acknowledge the authors of the original publications selected in the review. We also thank Dr. Thathya Wijewickrama for the assistance in literature search, and Mr. W.A. Jayasiri, Director (Industrial Relations) and Ms. Himali Urugodawatta, Senior Deputy Director (Industrial Relations), Board of Investment of Sri Lanka for the support in providing information.

Conflicts of interest

None declared

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