

Foot massage

World at work: Health hazards among foot massage workers in China

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A unique challenge to the medical community

Reflexology or foot massage has long been part of Chinese tradition and culture. It is believed that foot massage can not only maintain and promote health but also cure a variety of ailments. Foot massage is considered a form of relaxation and, to some extent, a luxury. With improved economy, foot massage has become widely popular in China, especially in coastal cities that have benefited from the recent expanded economy. For example, in Shanghai alone there are 1300–2000 foot massage facilities and the total number of foot massage workers in Shanghai is estimated to be close to 30 000. In Shenzhen, the booming city just north of Hong Kong, the number of foot massage facilities is estimated at 3000–4000, and the number of foot massage workers at more than 40 000.¹ Approximately 90% of foot massage workers in large cities are young females (aged 18–25), and most came from poor inland rural areas, where jobs are scarce and wages are low.

Foot massage workers are exposed to not only biological, chemical, and physical hazards, but also emotional and psychological stresses. The health problems associated with foot massage workers are not limited to China. Foot massage is also popular in other regions in Asia, such as Thailand, the Philippines, Hong Kong, Taiwan, Malaysia, and Singapore. In addition, foot massage facilities can also be found in Asian communities in large cities in America and Europe.

TASKS OF THE JOB

Foot massage facilities range in size from small storefront shops of no more than 40–50 squared metres to huge multi-floor buildings. The storefront of a typical small foot massage shop is shown in fig 1. Small foot massage facilities usually consist of a single open room that can accommodate four or five clients at one time. Ventilation, plumbing, and hygiene are usually inadequate at these small makeshift foot massage shops. Large foot massage facilities are made up of tens of small private and large open rooms. By comparison, large facilities are usually better ventilated and more hygienic.

Foot massage consists of three steps: soaking, cleaning, and massaging the client's feet; the entire process lasting approximately one hour. The client sits on a sofa or an armchair and, with pant legs rolled up, soaks his/her feet in a wooden bucket of warm water with Chinese herbal medicines and other chemicals for about 10–15 minutes (figs 2 and 3). The foot massage worker then cleans the client's feet with her/his bare hands using soap or other cleaning solutions (fig 4). The client's feet are then rinsed and dried with a towel (fig 5). The cleaning process takes about five minutes. The client then puts both feet on a low stool in front of the sofa. The foot massage worker sits directly in front of the stool and massages the client's feet. The process consists of applying massage oil or lotion to the client's feet and massaging the feet with

bare hands (figs 6 and 7). The foot massage worker uses her/his knuckles to apply pressure to different areas of the sole ("pressure or reflex points"), simultaneously slowly rotating her/his knuckles back and forth. The pressure or reflex points are supposedly connected to different organs, nerves, and glands of the body. It is believed that manipulating these pressure or reflex points helps to promote the "wellbeing" of the respective organs, nerves, and glands. The massage itself takes about 40–45 minutes. The feet are then wiped clean with wet hot towels. In addition to foot massage, some facilities also offer a toenail cutting service. Traditional nail cutting knives are used (fig 8).

Most foot massage facilities open every day from midday to midnight (some as late as 2 or 3 am in the morning). On average, a foot massage worker handles 3–5 clients a day, and spends the rest of the time waiting for clients. Some workers, however, may work 14–16 hours and handle as many as 8 or 10 clients a day. In Shanghai, an hour of foot massage costs from ¥20 to ¥100 (exchange rate: US\$1 = ¥8.2), but the foot massage worker gets only 10–40% of what the shop charges. On average, a worker makes ¥10 for an hour of foot massage, but does not get paid if there is no client. A foot massage worker earns approximately ¥1000 to ¥2000 a month.

HEALTH HAZARDS OF THE JOB

Foot massage workers are exposed to not only biological, chemical, and physical hazards, but also emotional and psychological stresses.

Infection

Because foot massage workers constantly come into direct dermal contact with clients, infection is their most serious health hazard. Foot massage workers handle the clients' feet, soaking solutions, massage oils, wet towels, and nail cutting knives (the traditional cutting tool of choice). Fungi can be transmitted from clients with tinea to foot massage workers, who in turn may infect other workers



Figure 1 A typical small foot massage shop.



Figure 2 Inside a small foot massage shop.



Figure 3 Soaking of the feet in a bucket of warm water with herbal medicines.



Figure 4 Cleaning of client's feet in the bucket.

or other clients. Cases of head and body tinea have been reported among foot massage workers and clients.¹ In a survey, the number of total bacteria and *Escherichia coli* on 33.08% of towels tested were found to exceed the national standards.² It has been reported that at some facilities, soaking solutions were used more than once for multiple clients.^{3,4} This practice of reusing soaking solutions increases the risk of infection among clients. For foot massage workers who performed toenail cutting services, their hands and fingers are at high risk of skin cuts. More importantly, the exposure pathway greatly increases the risk of blood transmitted diseases such as hepatitis B virus, human immunodeficiency virus, and sexually transmitted diseases through broken skin (open cuts, nicks, skin abrasions, dermatitis, and acne). The serious nature of infectious blood borne pathogens notwithstanding, however, no study on the prevalence of infectious diseases among foot massage workers has been conducted.

Chemicals in soaking solutions and massage oils

Foot massage workers are directly exposed to Chinese herbs and chemicals in soaking solutions when they prepare the solutions or when they clean the clients' feet in the solutions. They are further exposed to residuals of these herbs and chemicals on towels, buckets, and other surfaces. Herbs and chemicals used in preparing soaking solutions are produced by small vendors or foot massage



Figure 5 Drying the client's feet.



Figure 6 Massaging the client's feet with bare hands.

centres themselves. The exact composition varies widely, but the chief ingredient appears to be zuguang powder, which is a mixture of light yellow sophora root (a Chinese herb), orthohydroxybenzoic acid, benzenecarboxylic acid, and acidum boricum. It has been reported that long term exposure to zuguang powder can cause contact dermatitis.⁵ Typical chemicals in massage oils include lavender oil, vaselinum, sodium chloride, polyoxyethylene monostearin, mineral oil, almond oil, castor oil, propylene glycol, dimethylpolysiloxane, and propyl paraben. Despite the wide use of herbs and chemicals in the foot massage industry, only limited toxicity or safety tests of soaking solutions or massage oils have been conducted. For example, lavender oil has been shown to be cytotoxic to human skin cells *in vitro*,⁶ and cases of allergic contact dermatitis have been reported among massage workers.⁷⁻⁹ However, the health risks from long term exposure to these herbs and chemicals in soaking solutions or massage oils remain largely unclear. In particular, most foot massage workers are female and aged 18–25 years. The likelihood of reproductive hazards to the workers is yet another grave concern.

Musculoskeletal and joint disorders

As a result of constantly applying pressure using their fingers, knuckles, and palms, most foot massage workers develop progressive digital and palmar cornification (figs 6–9). During massage, foot massage workers sit on non-adjustable stools



Figure 7 Massaging the client's feet with oil.



Figure 8 Cutting a client's toenails.

without back support. Often they have to elevate their arms or elbows and hunch their backs to apply pressure at proper angles. Depending on the physical layout and personal stature, some foot massage workers may have to lean forward during massage. Long hours of improper posture and poor ergonomics place undue stress on the spine, which can result in low back pain and kyphorachitis. Repetitive motions of the hand, wrist, and fingers and prolonged sitting increase the workers' risk of musculoskeletal injuries. Furthermore, foot massage workers constantly come into contact with soaking solutions and wet towels (figs 4 and 5), which increase their risk of arthritis (fig 9). Many foot massage workers are aware of the risk and worry about developing arthritis in the future. Although these medical conditions are well known among foot massage workers, no formal studies have been conducted to assess the extent of the problems.

Psychological problems

Many foot massage workers have low esteem of their work and of themselves. The great majority of them are young and away from home for the first time in large cities. Female foot massage workers are sometimes harassed by clients with unwanted sexual advances. Many workers live in overcrowded "dormitories". Long hours and night work may result in social isolation in some foot massage workers. There is little or no family or social support for these workers.



Figure 9 Foot massage of a worker's hand with arthritis and cornified fingers.

MEASURES TO PROTECT WORKERS

In 2002, China passed the new *Occupational Diseases Prevention and Control Act*, signifying the government's commitment to improve the environment of the workplace and to eradicate preventable occupational diseases.^{10 11} New and more stringent occupational exposure limits were set and occupational diseases were recognised and compensated. However, the foot massage industry, being a service industry, is not regulated by the new *Occupational Diseases Prevention and Control Act*. Health problems such as arthritis and infection among foot massage workers are not covered by the 2002 *Occupational Diseases Prevention and Control Act*. Workers who develop these diseases as a result of their employment do not get compensation from the government or their employers.

The health hazards among foot massage workers have long been overlooked by not only the government and employers but also the medical community. No training of health protection is provided to the workers. Little has been written on the health hazards in the foot massage industry. Potential health risks are not limited to foot massage workers, as clients can also be affected as well. To protect workers' and clients' health, as a start, the following issues and measures should be considered by the government, employers, and workers:

- Physical examinations of job applicants and workers
- Sterilisation of towels, buckets, and nail cutting tools
- Washing of hands with antibiotic soap after each massage
- Toxicity and safety evaluations of herbs and chemicals
- Better ergonomics
- Good housekeeping
- Adequate ventilation
- Personal hygiene policy
- Health education and training of the workers
- Recognition of the health problems as compensable occupational diseases.

Foot massage workers represent a fast growing workforce in China and other regions in Asia. They are exposed to not only biological, chemical, and physical hazards, but also emotional and psychological stresses. The health hazards among foot massage workers, which have long been overlooked, present some unique challenges to the medical community.

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