

## Short Communication

### The back happy tap-stand

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#### ABSTRACT

Low back pain is a significant problem in low-income countries. In a prevalence study in 19 villages in rural Tibet (China), 34.1% of people complained of low back pain at the time of the interview. The collection of water, an activity primarily conducted by women, was found to be one of the major risk factors. In response to the study, training in prevention and management of low back pain was conducted and a back happy tap-stand was designed and installed in more than 30 villages. The tap-stand has a high tap and waist-high bench, thereby reducing the need to bend the lower back when filling and lifting water containers. Many women rated the tap-stand as the most significant improvement to their lives in the previous three years. The back happy tap-stand eases women's burden when collecting water and has the potential to reduce the prevalence and associated disability of low back pain.

**Key words** | low back pain, tap-stand, Tibet

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#### INTRODUCTION

Low back pain is a significant problem in low-income countries (Worku 2000; Omokhodion 2002; Hoy *et al.* 2003). One activity that puts the lower back at risk for injury is the collection of water (Hoy *et al.* 2003). Many studies suggest that forward compression of the spine, which usually takes place when lifting and is commonly observed in the collection of water, may cause injury to the lower back (Panjabi *et al.* 1982; Shirazi-Adl & Parnianpour 1999).

#### BACKGROUND

In a baseline assessment for the Tibet Primary Health Care and Water Supply Project<sup>1</sup>, serving 165 villages in rural Tibet, many people, especially women, identified low back pain as a serious health problem. As a consequence, a prevalence survey of 19 rural villages (499 people 15 years and older) was conducted and found that 34.1% (95% CI

27.9–40.3% [170 people]) of people had low back pain at the time of the survey. The survey also found that 20% of the villagers had substantial functional disability from their low back pain (Hoy *et al.* 2003).

The collection of water, an activity primarily conducted by women, was found to be one of the main risk factors for low back pain. Water collection points were usually a significant distance from the home, with collection involving a long walk with a 20-litre metal container on the back. Original tap-stands consisted of a ground-level trough and waist-high tap (see Figure 1). The container was filled at ground level and, once it was full, the woman placed a rope, which was attached to either side of the top of the container, around the back of her neck. Then, with her back bent and knees fully extended (straight), she hoisted the container off the ground. Following this, she swung the container full of water around onto her back, and then walked back to her home. This activity was performed several times throughout each day and many women reported experiencing low back pain after collecting water (Hoy *et al.* 2003).

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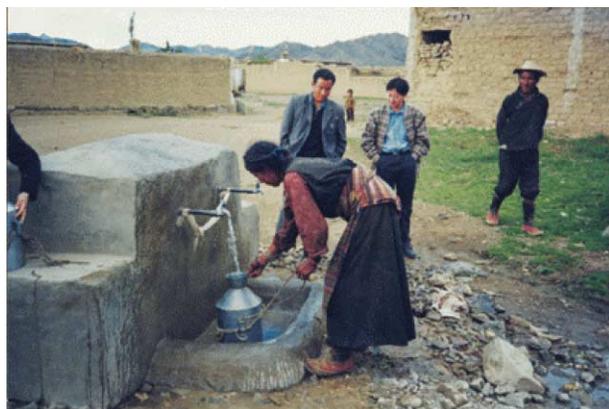


Figure 1 | The original tap-stand

## THE BACK HAPPY TAP-STAND

In response to this problem, the Project conducted training for city and township doctors in the prevention and management of low back pain. It also changed the design of its tap-stands from the original lower tap-stand (Figure 1) to the back happy tap-stand (BHTS) (Figure 2).

The BHTS has a waist-high bench 900 mm above the ground, and a higher tap in addition to the original lower tap. Due to the typical height of a water container (about 500 mm), the higher tap is positioned 600 mm above the bench and so about 1500 mm above ground level. This eliminates the need for women to bend and lift when collecting water. The woman places the container on the waist-high bench, fills it, places the rope over her shoulders and walks home. The higher level outlet is not accessible to young children, but this is considered an advantage since it



Figure 2 | The back happy tap-stand

lowers the risk of children being sent to fetch water and reduces opportunities for wastage.

The BHTS also retains the lower tap and trough from the original design so that women can continue to use the stand to wash their children and household items. The BHTS was installed in more than 30 villages and was only marginally more expensive to construct than the original tap-stand, with a total materials cost of approximately US\$65 per stand.

The pillar and bench are made from local stone with a cement mortar and render. The pipes are wrapped in hessian to reduce the risk of freezing, while the large bulk of the tap-stand provides additional installation and thermal mass. An extra metre of residual water pressure was provided to ensure that water can flow from both the upper and lower outlets at a reasonable rate ( $>0.15$  L/s). Where necessary, this was done using a slightly larger supply pipe diameter. The additional water pressure required due to the increased height of the outlet did not result in a measurable increase in cost, and was typically a significant factor only in very flat systems, where there was little available elevation.

The BHTS also presents an excellent opportunity for health promotion, particularly in raising awareness of ways to prevent and manage musculoskeletal problems such as low back pain.

## RESULTS AND CONCLUSIONS

Tibetan community members were very enthusiastic about the back happy tap-stand and, in the final evaluation of the Project, many women felt it was the most significant improvement to their lives over the previous three years. Interventions such as the design and installation of the back happy tap-stand may help to reduce the burden of low back pain and its associated disability, enhance beneficial water usage in households, leading to improved hygiene and health outcomes, and better the quality of women's lives.

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