

- southern Ontario boys with low height percentiles. *Am J Clin Nutr* 1989;49:1266-75.
- 2 Black RE, Sazawal S. Zinc and childhood infectious disease morbidity and mortality. *Br J Nutr* 2001;85(suppl 2):S125-9.
 - 3 Bhutta ZA, Black RE, Brown KH, Gardner JM, Gore S, Hidayat A, et al. Prevention of diarrhea and pneumonia by zinc supplementation in children in developing countries: pooled analysis of randomized controlled trials. Zinc Investigators' Collaborative Group. *J Pediatr* 1999;135:689-97.
 - 4 Bhutta ZA, Bird SM, Black RE, Brown KH, Gardner JM, Hidayat A, et al. Therapeutic effects of oral zinc in acute and persistent diarrhea in children in developing countries: pooled analysis of randomized controlled trials. *Am J Clin Nutr* 2000;72:1516-22.
 - 5 Shankar AH, Genton B, Baisor M, Paino J, Tamja S, Adiguma T, et al. The influence of zinc supplementation on morbidity due to *Plasmodium falciparum*: a randomized trial in preschool children in Papua New Guinea. *Am J Trop Med Hyg* 2000;62:663-9.
 - 6 Caulfield LE, Zavaleta N, Shankar AH, Meriandi M. Potential contribution of maternal zinc supplementation during pregnancy to maternal and child survival. *Am J Clin Nutr* 1998;68(2 suppl):S499-508.
 - 7 Goldenberg RL, Tamura T, Neggers Y, Copper RL, Johnston KE, DuBard MB, et al. The effect of zinc supplementation on pregnancy outcome. *JAMA* 1995;274:463-8.
 - 8 Osendarp SJ, van Raaij JM, Darmstadt GL, Baqui AH, Hautvast JG, Fuchs CJ. Zinc supplementation during pregnancy and effects on growth and morbidity in low birthweight infants: a randomised placebo controlled trial. *Lancet* 2001;357:1080-5.
 - 9 Sazawal S, Black RE, Menon VP, Dinghra P, Caulfield LE, Dhingra U, et al. Zinc supplementation in infants born small for gestational age reduces mortality: a prospective, randomized, controlled trial. *Pediatrics* 2001;108:1280-6.
 - 10 Fortes C, Forastiere F, Agabiti N, Fano V, Pacifici R, Virgili F, et al. The effect of zinc and vitamin A supplementation on immune response in an older population. *J Am Geriatr Soc* 1998;46:19-26.
 - 11 Girodon F, Galan P, Monget AL, Boutron-Ruault MC, Brunet-Lecomte P, Preziosi P, et al. Impact of trace elements and vitamin supplementation on immunity and infections in institutionalized elderly patients: a randomized controlled trial. MIN. VII. AOX. geriatric network. *Arch Intern Med* 1999;159:748-54.
 - 12 Keen CL, Uriu-Hare JY, Hawk SN, Jankowski MA, Daston GP, Kwik-Urbe CL, et al. Effect of copper deficiency on prenatal development and pregnancy outcome. *Am J Clin Nutr* 1998;7(suppl 5):S1003-11.
 - 13 Institute of Medicine, Subcommittee on Nutritional Status and Weight Gain During Pregnancy. *Nutrition during pregnancy. Part 1: weight gain. Part 11: nutrition supplements*. Washington, DC: National Academy Press, 1990.

Cross sectional, community based study of care of newborn infants in Nepal

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Abstract

Objective To determine home based newborn care practices in rural Nepal in order to inform strategies to improve neonatal outcome.

Design Cross sectional, retrospective study using structured interviews.

Setting Makwanpur district, Nepal.

Participants 5411 married women aged 15 to 49 years who had given birth to a live baby in the past year.

Main outcome measures Attendance at delivery, hygiene, thermal care, and early feeding practices.

Results 4893 (90%) women gave birth at home. Attendance at delivery by skilled government health workers was low (334, 6%), as was attendance by traditional birth attendants (267, 5%). Only 461 (8%) women had used a clean home delivery kit, and about half of attendants had washed their hands. Only 3482 (64%) newborn infants had been wrapped within half an hour of birth, and 4992 (92%) had been bathed within the first hour. 99% (5362) of babies were breast fed, 91% (4939) within six hours of birth. Practices with respect to colostrum and prelacteals were not a cause for anxiety.

Conclusions Health promotion interventions most likely to improve newborn health in this setting include increasing attendance at delivery by skilled service providers, improving information for families about basic perinatal care, promotion of clean delivery practices, early cord cutting and wrapping of the baby, and avoidance of early bathing.

Introduction

Although infant mortality has fallen in many developing countries over the past two decades, the rate of fall may be slowing.¹ One reason is the resistant contribu-

tion of neonatal mortality, which has remained fairly steady over this period.^{2,3} For many mothers, health care during and after childbirth is virtually non-existent, and in 2000, an estimated 53 million women in developing countries gave birth without professional help.⁴

The World Health Organization guidelines for essential newborn care encompass cleanliness, thermal protection, initiation of breathing, early and exclusive breast feeding, eye care, immunisation, management of illness, and the care of low birthweight infants.⁵ For a mother and her family, this means preparing for birth, choosing a safe place for delivery, keeping the process clean, avoiding the cold, breast feeding early and exclusively, and understanding (and reacting to) potential danger signs. Our understanding of what happens at home and how to change behaviour is limited. The aim of the present study was to describe newborn care practices quantitatively in the cohort of women recruited to the trial.

Participants and methods

Setting

Nepal has a population of 23.4 million with more than 60 ethnic groups. The landscape tiers down from the Himalayas, through middle hills, to plains in the south.⁶ The population is poor, and there are limited communications and infrastructure. The gross national product per head is about \$220 (£145, €223),⁷ the human development index is 0.378,⁸ life expectancy is 58 years, about 60% of adults are illiterate,⁷ the total fertility rate is 4.8 in rural areas, and early marriage and adolescent pregnancy are common.⁹

Nepal's estimated neonatal mortality rate is 50/1000 live births and accounts for two thirds of the infant mortality rate (79/1000).⁹ Less than half of pregnant women attend for any antenatal care,⁹⁻¹³ and

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over 90% of births occur at home.⁹ After marriage, women usually move into their husband's family home and their mother-in-law becomes the central female figures in their lives. They give birth at home in the company of female friends and family, and their mother-in-law often takes the lead in advising on birth, childcare, illness, and when and where to seek professional help.

Nepal introduced integrated primary health care in the late 1970s, with tertiary hospitals at the centre, zonal and district hospitals in the periphery, and a hierarchy of primary health centres, health posts, and subhealth posts in the community. The system suffers from unfilled posts, absenteeism, shortfalls in equipment and drugs, limited support to community based staff, and a lack of refresher training.¹⁴

Makwanpur district

Makwanpur district lies to the south of Kathmandu and has a population of nearly 400 000. It covers an area of 2500 km² and includes both hills and plains. Over much of the district access is difficult and villages are widely spread. Most residents are engaged in small scale agriculture. There are at least 15 ethnic groups.

Study design

We identified and mapped 28 376 households between September 1999 and June 2000. Each married woman of reproductive age (15-49 years) was allocated a unique identification number and visited by the field team to complete an individual questionnaire, including questions about newborn care during any preceding birth (see bmj.com for further details).

Results

We interviewed 25 702 women, of whom 24 295 had given birth at least once, 24 244 to a live baby. Because of concerns about the validity of recall over longer periods and the likelihood that practices have changed over time, we limited our analysis to the 5411 live births within the year before the start of the study. The median age of respondents was 25 years (interquartile range 9 years).

Skilled attendance at delivery

In all, 4893 (90%) of women gave birth at home, either inside or in the courtyard. The district hospital accounted for 251 (5%) births. Six hundred and nineteen (11%) women gave birth alone. When an attendant was present, she was usually a family member or neighbour (4241, 78%), particularly the woman's mother-in-law (2178, 40%).

We grouped the birth attendants into skilled attendants (doctors, nurses, auxiliary nurse midwives, and health assistants), semiskilled (village health workers, maternal and child health workers, and female community health volunteers, who are not technically trained in delivery and newborn care), and traditional birth attendants (many of whom have received training in obstetric care). On this basis, skilled attendants covered 6% of births (334), semiskilled attendants covered less than 2% (96), and traditional birth attendants covered 5% (267).

Cleanliness and hygiene practices at childbirth

In all, 55% of women (2729/4792) recalled that helpers had washed their hands before the birth of the

baby, 1372 (28%) recalled that they had not done so, and 691 (14%) could not clearly remember. Clean home delivery kits are currently manufactured and distributed in Nepal. Each kit contains a plastic sheet, a clean razor blade, a cutting surface, soap, and cord ties. Every woman interviewed was shown such a kit: 461 (8%) had used one for their last delivery, 631 (12%) recognised the kit but had not used one, and 4319 (80%) did not recognise it.

The umbilical cord was cut with a razor blade in 3017 (56%) births (table 1). Once the cord had been cut, the umbilical stump was usually left undressed (73%). The most common application was oil (18%). Nearly all newborn infants were wrapped in used pieces of cloth (table 1).

Thermal control

Given that most births occurred at home, usually indoors, we asked about the use of a fire to heat the birth room. There was some form of heating in 3683 (68%) rooms after the baby had been delivered, and in 1398 (26%) rooms the fire was laid for the labour. The time taken to wrap the baby was prolonged. Only 3482 (64%) had been wrapped within half an hour, rising to 5102 (94%) within an hour. Almost all babies had been bathed within six hours of birth, three quarters within the first half hour, and 92% (4992) within an hour.

Breast feeding

Ninety nine per cent (5362) of women had breast fed (table 2). Breastfeeding rates were about 99% at one week. Colostrum was discarded before the first feed in 2416 cases (45%); foremilk was discarded at every subsequent feed in 3696 (69%).

Ethnic group comparison

The ethnic composition of respondents was Tamang (65%), Brahmin or Chhetri (17%), other Tibeto-Burman groups (8%), and other artisanal groups (7%). Although the general findings were similar for all groups, there were some minor differences. Tamang people tended to be poorer, to be engaged in agriculture, and to live further away from amenities. Tamang

Table 1 Hygiene practices at delivery

	No (%) of births (n=5411)
Instrument used for cutting umbilical cord:	
New or boiled blade	1787 (33)
Sickle or wood knife	1947 (36)
Old unboiled blade	1230 (23)
Household knife	314 (6)
Other	44 (1)
Unknown	89 (2)
Dressing applied to umbilical stump:	
Nothing	3970 (73)
Oil	994 (18)
Disinfectant	116 (2)
Turmeric	9 (0.2)
Cloth	15 (0.3)
Mud	9 (0.2)
Other	156 (3)
Unknown	142 (3)
Cloth for wrapping the baby:	
Old washed cloth	3803 (70)
Old unwashed cloth	1385 (26)
New washed cloth	79 (1)
New unwashed cloth	18 (0.3)
Unknown	126 (2)

women were more likely to give birth outdoors and to cut the cord with a sickle and less likely to be attended by a service provider. This was also true of artisanal castes. Newar and Brahmin or Chhetri groups tended to be better off. They were more likely to deliver at a hospital, to be attended by health service providers, and to use clean home delivery kits and clean blades. They were less likely to give birth alone. Two ethnic differences were striking: Brahmin and Chhetris were much more likely to give a taste of sweet food as the first feed, whereas Tamangs and women from artisanal castes were more likely to discard first colostrum and subsequent foremilk.

Discussion

Our study has shown that use of a skilled birth attendant and uptake of government primary care services for childbirth and newborn care are uncommon in rural Nepal, hygiene is often compromised, and traditional practices expose newborn infants to a risk of hypothermia. However, early breastfeeding rates are better than expected and colostrum is only partially discarded.

Assistance with childbirth

The high proportion of home births is consistent with the findings of previous studies.^{9–10} The status of a woman's mother-in-law means that she is the most likely person to help during pregnancy, labour, and the postpartum period. Attendance by trained service providers was extremely limited for both skilled government health staff (6%) and traditional birth attendants (5%), confirming previous findings.^{9–10–12–15} Efforts to work with mothers-in-law and other family members may yield higher dividends in the short term.

We should be aware that 11% of women gave birth alone. This echoes previous findings,⁹ highlights the gender inequity that underpins many discussions of health, and may imply that childbirth is of limited urgency within a range of family concerns. In the longer term, efforts to strengthen outreach midwifery services should be a major priority. This will require a change in investment policy for reproductive health services and, given low levels of attendance by skilled health staff, may require years of investment to reduce mortality at a population level.

Table 2 Type and timing of first feed

	No (%) of infants (n=5411)
Infant's first feed:	
Mother's milk	4601 (85)
Ghee, sugar, or honey	670 (12)
Breastmilk from another woman	30 (1)
Cows' or buffalos' milk	19 (0.4)
Formula	11 (0.2)
Oil	8 (0.1)
Other	22 (0.4)
Unknown	50 (1)
Time to first breast feed:	
≤15 min	159 (3)
≤30 min	950 (18)
≤1 hour	3403 (63)
≤6 hours	4939 (91)
≤12 hours	5017 (93)
≤24 hours	5157 (95)
>24 hours or never	254 (5)

What is already known on this topic

Most births in rural south Asia occur at home

Neonatal mortality has remained fairly constant in developing countries despite falling infant mortality

What this paper adds

Only 6% of births in rural Nepal took place in the presence of a skilled attendant

Cord cutting implements were often unclean and drying and wrapping of newborn infants was usually delayed

99% of babies were breast fed, 92% of them within six hours of birth, and colostrum was generally given

Interventions need to focus on educating women about hygiene, encouraging early wrapping, and delaying bathing of newborn babies

Hygiene and warmth

Infection may account for up to 40% of neonatal mortality.¹⁶ Only half the attendants were said to have washed their hands. The use of razor blades to cut the cord is positive, although their cleanliness was suspect in two thirds of cases. Similarly, it is encouraging that 73% of umbilical stumps were not dressed, a higher percentage than previously estimated.¹⁰ The means of cutting the cord may not be as important a risk factor for infection as the means of subsequent dressing.¹⁷

Neonatal hypothermia has been described in Nepal¹⁸ and is a focus for essential newborn care.¹⁹ The common view of pregnancy as a hot state and the postpartum period as a cold one^{20–22} ensures that mothers and their babies are kept warm in the puerperium²³; we found that 68% of rooms were heated after labour. Unfortunately, this is counterbalanced by the practice of waiting for the placenta to deliver before cutting the umbilical cord and wrapping the baby²² and by the tendency to bathe the baby so soon after birth.

Infant feeding

One area where traditional practices seem healthy is breast feeding. This positive finding has implications for nutrition, prevention of infection, and thermal control and should be supported wholeheartedly.

Implications

Our study has identified important information about newborn care practices in rural Nepal that will assist in planning health interventions to change behaviour. In terms of public health and population attributable risk, the findings suggest that some changes would be particularly beneficial. These include increasing skilled attendance at births, improving hygiene at delivery, reducing delays in wrapping the baby, and delaying bathing. Interventions to reduce the use of prelacteal and stop women discarding colostrum and foremilk are likely to have a smaller effect.

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- 1 United Nations Children's Fund. *Trends in childhood mortality in the developing world 1960-1996*. New York: Unicef, 1999.
- 2 Bhawe S. Trends in perinatal and neonatal mortality and morbidity in India. *Indian Pediatr* 1989;26:1094-9.
- 3 Claeson M, Bos E, Mawji T, Pathmanathan I. Reducing child mortality in India in the new millennium. *Bull WHO* 2000;78:1192-9.
- 4 United Nations Fund for Population Activities. *The state of the world's population 2000: lives together, worlds apart*. New York: UNFPA, 2000.
- 5 World Health Organization. *Essential newborn care. Report of a technical working group (Trieste, 25-29 April 1994)*. Geneva: WHO, Division of Reproductive Health (Technical Support), 1996.
- 6 Central Bureau of Statistics. *Statistical year book of Nepal 2001*. Kathmandu: His Majesty's Government National Planning Commission Secretariat, 2001.
- 7 World Bank. *World development report 2002. Building institutions for markets*. Washington, DC: Oxford University Press, 2002.
- 8 Nepal South Asia Centre. *Nepal human development report 1998*. Kathmandu: Nepal South Asia Centre, 1998.
- 9 Pradhan A, Aryal R, Regmi G, Ban B, Govindasamy P. *Nepal family health survey 1996*. Kathmandu and Calverton: Ministry of Health, Nepal; New ERA; Macro International, 1997.
- 10 His Majesty's Government, Nepal. *Further analysis report on antenatal, delivery, postnatal services, literacy and polio coverage. Nepal multiple indicator surveillance fifth cycle (March-May 1997)*. Kathmandu: National Planning Commission Secretariat, Central Bureau of Statistics, Unicef Nepal, 1998.
- 11 His Majesty's Government, Nepal. *Care during pregnancy and delivery: implications for protecting the health of mothers and their babies. Nepal multiple indicator surveillance fifth cycle (March-May 1997)*. Kathmandu: National Planning Commission Secretariat, Unicef Nepal, 1998.
- 12 Family Health Division. *The contributions of trained TBAs in Nepal*. Kathmandu: Family Health Division, Department of Health Services, His Majesty's Government, Nepal. Centre for Economic Development and Administration, Kirtipur, 1998.
- 13 Department of Health Services. *Annual report 2056/57 (1999/2000)*. Kathmandu: Department of Health Services, His Majesty's Government of Nepal, 2001.
- 14 Justice J. The invisible worker: the role of the peon in Nepal's health service. *Soc Sci Med* 1983;17:967-70.
- 15 Manandhar M. *Birth practices study. Remote area basic needs project-Bajura*. Kathmandu: CARE Nepal, 1999.
- 16 Bang A, Bang R, Baitule S, Deshmukh M, Reddy M. Burden of morbidities and the unmet need for health care in rural neonates—a prospective observational study in Gadchiroli, India. *Indian Pediatr* 2001;38:952-65.
- 17 Traverso H, Bennett J, Kahn A, Agha S, Rahim H, Kamil S, et al. Ghee applications to the umbilical cord: a risk factor for neonatal tetanus. *Lancet* 1989;i:486-8.
- 18 Ellis M, Manandhar N, Shakya U, Manandhar D, Fawdry A, Costello AM de L. Postnatal hypothermia and cold stress among newborn infants in Nepal monitored by continuous ambulatory recording. *Arch Dis Child Fetal Neonatal Ed* 1996;75:F42-5.
- 19 World Health Organization. *Thermal control of the newborn: a practical guide*. Geneva: Maternal Health and Safe Motherhood Programme, Division of Family Health, WHO, 1993.
- 20 Goodburn E, Rukhsana G, Chowdhury M. Beliefs and practices regarding delivery and postpartum maternal morbidity in rural Bangladesh. *Stud Fam Plann* 1995;26:22-32.
- 21 Nichter M, Nichter M, eds. The ethnophysiology and folk dietetics of pregnancy: a case study from South India. *Hum Organiz* 1983;42:235-46.
- 22 Tamang S, Mesko N, Shrestha B, Osrin D, Manandhar M, Standing H, et al. A qualitative description of perinatal care practices in Makwanpur district, Nepal. *Contrib Nepalese Stud* 2001;28:10-9.
- 23 Yengar S, Bhakoo O. Prevention of neonatal hypothermia in Himalayan villages. *Trop Geogr Med* 1991;43:293-6.

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Influence of psychological coping on survival and recurrence in people with cancer: systematic review

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Abstract

Objective To summarise the evidence on the effect of psychological coping styles (including fighting spirit, helplessness/hopelessness, denial, and avoidance) on survival and recurrence in patients with cancer.

Design Systematic review of published and unpublished prospective observational studies.

Main outcome measures Survival from or recurrence of cancer.

Results 26 studies investigated the association between psychological coping styles and survival from cancer, and 11 studies investigated recurrence. Most of the studies that investigated fighting spirit (10 studies) or helplessness/hopelessness (12 studies) found no significant associations with survival or recurrence. The evidence that other coping styles play an important part was also weak. Positive findings tended to be confined to small or methodologically flawed studies; lack of adjustment for potential confounding variables was common. Positive conclusions seemed to be more commonly reported by smaller studies, indicating potential publication bias.

Conclusion There is little consistent evidence that psychological coping styles play an important part in survival from or recurrence of cancer. People with

cancer should not feel pressured into adopting particular coping styles to improve survival or reduce the risk of recurrence.

Introduction

It is a popular belief that psychological factors can influence survival from cancer, particularly breast cancer.¹ Such an association is biologically plausible, and several possible mechanisms have been proposed—for example, through immunological and neuroendocrine mechanisms.^{2,3} The evidence, however, is conflicting.

We carried out a comprehensive systematic review to assess the strength of the evidence for an association between psychological coping and cancer outcome.

Methods

Search strategy—We searched several databases for published and unpublished studies (in any language) on the association between progression of cancer, recurrence or survival, and psychological coping: Medline 1966-June 2002, PsycINFO 1887-June 2002, ASSIA 1987-June 2002, Embase 1980-June 2002, Cancerlit 1966-June 2002, Dissertation Abstracts 1975-June 2002, the NLM gateway (accessed 21 June 2002),