

Perspective

Unseen Health Costs of Son Preference: Examining Fertility Behaviors and Gendered Birth Intervals

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Abstract: In Pakistan, the major reason for shorter interpregnancy intervals commonly following the birth of a girl is due to cultural and religious preference for boys. In addition, this short birth spacing becomes the main reason for morbidity and mortality among mothers and children in Lower Middle-Income Countries. This article highlights the association between different social and cultural norms, gender inequality, and how male child preference affects maternal health practices.

Based on regional and national data, it claims that gender sensitive, culturally grounded interventions are vital for promoting healthy birth spacing. Important strategies include enlisting the support of religious leaders and other stakeholders, mixing gender awareness into community family planning programs, and connecting men and family heads in counselling.

Therefore, in Pakistan, addressing daughter-driven short birth intervals in highly crucial step towards gender-based approach and a way forward for achieving SDG-3 & 5 (Sustainable Development Goals) for health and well-being and gender equality.

Keywords: Fertility behavior, Family planning, Maternal Health, Health Cost, Anemia.

BACKGROUND

Birth spacing is referred as the time period or the interval between consecutive pregnancies and has a pivotal role in Maternal, Neonatal and Child Health (MNCH). As recommended by World Health Organization (WHO) the ideal time period for an interval is thirty-three months to reduce the risks of maternal anemia, pregnancy-related complications, premature birth and neonatal mortality. Evidence from various low-middle-income countries has reported that short birth intervals remarkably increase the chances of maternal weakness, low birth weight, and maternal malnutrition [1].

However, in Pakistan, medical knowledge and fixed patriarchal structures contribute less to reproductive independence. Family heads, especially husbands, mothers, and fathers-in-law, often command women's fertility decisions, leading to limited access to contraception, low negotiation power, and restricted decision-making independence [2]. The cultural driver of short birth intervals is the preference for sons, which leads communities to recognize daughters as economically burdensome and socially less valuable [3]. This creates a phenomenon known as "The Rush for an Heir" where women are coerced into conceiving again if the previous child was a girl. In parallel to cultural norms, women, as per religious obligations, perceived motherhood at an early age, reinforcing high fertility and discouraging contraceptive use and conflicting with faith [4]. Approximately 60% of births occur within inefficient spacing and short birth

intervals, most commonly seen after the birth of a daughter, as documented by the Pakistan Demographic and Health Survey (PDHS 2017–18) [5]. The purpose of this article is to analyze the gender preferences and their effects on birth spacing critically and highlight the cultural and social norms, and what evidence-based strategies are essential to address these issues. This study has a combination of information from gender based studies, reproductive health studies, and behavioral sciences to create a holistic approach to focus more on this issue and to improve maternal health across Pakistan.

The Gendered Nature of Birth Intervals

Male dominating culture is still deeply rooted in the societies of Pakistan. It is believed that sons are the sign of power and family respect, continuity of heredity, and they provide financial support, while daughters are considered a burden as they are associated with dowry. All these views affect reproductive health and birth preferences.

PDHS 2017–18 demonstrated that approximately 60% of births happen in less than 2.5 years, and intervals are even shorter after the birth of a daughter. This reflects the sociocultural pressures for male birth preference instead of medical factors and short birth intervals [5]. There are variations influenced by different provinces, cultures, ethnic groups, and educational differences across Pakistan in the factors and severity of male preferences.

More preferences for the birth of a son are commonly seen in some cultures and traditional tribal communities, where social status, land inheritance, and continuity of heredity are very

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highly valued. These beliefs are associated with some typical cultural, ethnic, and rural communities.

The cultural perception of daughters as an "economic burden" and "socially less valuable" is a powerful driver of short birth intervals [6].

The pressure for a son remains strong among lower socio-economic strata. However, less-educated women often face the maximum pressure and lowest negotiation power regarding birth spacing and contraceptive use. Higher education status improves a woman's reproductive independence [7].

Lastly, religious beliefs also strongly influence fertility behavior, as in Islamic discourages contraceptive use and support motherhood, while Hindu communities exhibit a stronger inclination towards sons and aversion towards daughters [4,8].

Indicators Related to Birth Spacing in Pakistan

Pakistan has demonstrated various socio-economic indicators

Table 1. Indicators of “The Rush” (Fertility Behavior Driven by Son Preference).

Indicator	Definition	Context / Justification
Inter-Pregnancy Interval (IPI)	Median number of months between repeated pregnancies, compared by the sex of the previous child.	Shorter intervals after a daughter statistically confirm the intense social pressure placed on women to quickly conceive again in hopes of a son.
Parity Progression Ratio (PPR)	The probability of a family having another child, based on the sex composition of their existing children.	A significantly higher ratio among families with only daughters clearly demonstrates that fertility continuation is heavily driven by son preference.
Contraception Use	The rate and freedom of family planning utilization among women.	Women who have not yet had a son are often emotionally depressed or actively disallowed by family structures from using contraception to space or stop births.

Table 2. Indicators of Hidden Health Costs (Consequences on Maternal & Child Health).

Indicator	Definition	Context / Justification
Maternal Anemia & Mal-nutrition	The prevalence of physical and nutritional depletion in women of child-bearing age.	Short inter-pregnancy intervals inhibit a mother's body from recovering, leading directly to maternal depletion syndrome and severe anemia.
High Parity Births	The rate of births to women who already have five or more children.	Often the direct result of tireless attempts to produce a son, which continuously compounds the risk of maternal mortality.
Neonatal Mortality Rate (NMR)	Deaths per 1,000 live births (before 28 days), stratified by the length of the birth interval.	Babies conceived rapidly after a previous birth (especially following daughters) suffer significantly higher mortality rates due to compromised maternal health.
Low Birth Weight (LBW)	The rate of children born weighing below the healthy threshold.	Rapid, successive pregnancies prevent the restoration of maternal nutrients, depriving the fetus and drastically increasing the risk of LBW.
Excess Female Mortality (< 5 Years)	The gap between observed and expected mortality rates for female children under five.	Girls born after short intervals face a dual threat: biological disadvantage from a depleted mother, coupled with the social neglect associated with son preference.

that influence the fertility behavior, preference for sons, and hidden consequences on maternal and child health. The rush fertility behavior reflects the tendency of couples for early pregnancy to validate their fertility and build a progeny as depicted in Table 1. On the contrary, the preference for sons also drives the decision to have children with a shorter birth interval until they can achieve the desired male children. Moreover, the hidden cost of maternal morbidity, low birth weight, and preterm birth is closely associated with closely spaced pregnancies, placing extra pressure on the health care system and household expenses as depicted in Table 2. Pakistan Demographic Health Survey (PDHS) has highlighted the key indicators related to birth spacing as shown in Table 3 [5].

In Pakistan, the unmet need for family planning (FP) remains high, parallel to the low contraceptive prevalence rate (CPR). The major barriers towards family planning are still misconceptions, religious bans, extended families' intrusions and limited independent decision making [9,10].

Table 3. Indicators for Birth Spacing in Pakistan.

Indicator	Value
Births spaced <33 months	≈ 60%
Short Birth Interval (SBIs) higher after birth of daughter	Yes
Unmet need for family planning	17%+

Pregnancy Desires by Sex of Previous Child

Regular or unwanted pregnancies analyzed by gender of earlier child. Wanted / Intended: ~85% to 90% pregnancies after daughter.

Table 4. Provincial Comparison of Indicators Related to Birth Spacing.

Province	Sex Ratio at Last Birth 1990-91	Sex Ratio at Last Birth 2017-18	Child Sex Ratio 1990-91	Child Sex Ratio 2017-18	Desired Sex Ratio 1990-91	Desired Sex Ratio 2017-18
Punjab	119.23	127.54	109.22	103.07	113.99	128.61
Sindh	109.85	121.06	99.40	93.96	106.00	139.86
KPK	124.07	126.39	98.11	91.54	150.45	172.00
Balochistan	N/A	137.65	90.91	104.33	N/A	139.81

Table 4 represents Punjab consistently shows a higher SRLB, along with desired sex ratio reflecting a strong male preference. Sindh SRLB also increased over time, whereas the child sex ratio declined, suggesting vulnerable girls' survival, however, the desired ratio rose dramatically, pointing towards religious and cultural influence for bearing male child. KPK had persistent SRLB, with the desired sex ratio highest among all provinces, strongly pointing towards conservative cultural norms in the province to continue childbearing until a son is born. Balochistan had limited data; the desired sex ratio also reflects religious and cultural drivers aligned with giving birth until a son is born [11].

Existing Practices and Interventions in Pakistan

SBI affects negatively maternal and infant outcomes such as obstetrics complications; anemia, micronutrient deficiencies, depression and post-partum hemorrhage followed by infant morbidity, development delays, low birth weight, preterm birth and neonatal mortality [11]. Dealing with this deeply embedded issue of male child preference requires moving beyond a supply-side approach and applying Social Behavior Change Communication (SBCC) programs that focus mainly on cultural values.

Transitioning Towards Culturally Sensitive Public Health Interventions

Male Engagement

Husbands and male family members impose fertility decisions that drive the size of the family based on son preference; for

ters reflect. Unwanted / mistimed: ~10% to 15% pregnancies after daughters reflect [5].

Sex Ratio at Last Birth (SRLB)

Male to female ratio of last-born child in concluded families. Pakistan Demographic Health Survey (PDHS) reported the worst SRLB in the country. Ratio is presently 126 boys per 100 girls, reflecting that 44% of all last-born children are females in comparison to 55 % of males. Hence, the biological probability of having a boy child is differential, and behavior-wise, families are more likely to stop childbearing after the birth of a son [5].

impact male engagement has been prioritized. Evidence from PDHS has demonstrated that women with husband support for family planning are twice as likely to use contraceptives [5].

Lady Health Workers Program

The program has been the cornerstone for community engagement and outreach activities covering 60% of rural population. LHWs' counseling skills have contributed in promoting family planning by increasing Contraceptive prevalence rate up to 20% and unmet need for family planning by 5-7% [12]. Also addressing gender pressure of son preference, improving inter-spousal communication gap, and acceptability towards gender transformational shift.

Social and Mass Media Campaign

Activities like storytelling, theater, radio dramas, and community sessions, are being successfully used as tool for strengthening the positive aspects of gender norms and maternal health benefits by changing societal attitudes towards birth spacing.

Faith-Based Engagement

Religious scholars are one of the prime stakeholders assisting in dispelling the religious misconception of birth spacing and contraception as described by Islamic principles of women rights. UNFPA supported program in Punjab reported acceptability of birth spacing increased by 30% by dispelling misconception for contraception usage through local imams and religious scholars [4, 13, 14].

Economic Incentives

Families that follow a minimum birth interval of 33 months after the birth of daughter are enrolled in an expanded benefit component of the Benazir Income Support Program (BISP). Evaluation highlighted an increase by 12% in the uptake of birth spacing among registered couples [15].

Streamlined Family Planning Service Delivery

FP permanent methods, has risen from 6% to 14 % between 2012-2018 [16], especially long-acting reversible contraceptives (LARCs) as it has been integrated in Reproductive Mother and Neonatal Child Health Care (RMNCH) and rural health centers, utilizing the LHWs as counselors for assisting couples' decision making and providing the FP service.

The current interventions are still failing despite these efforts, which further requires a behavioral transformative shift towards gendered centered approach, reducing the harmful norms for continued pregnancy and son preference. Pakistan needs to adapt gender transformative strategies at primary care for (RMNCH), family planning programs, strengthening digitalization and surveillance, and identification of social drivers for SBIs by promoting research. For sustainable progress, male members of the family should be engaged actively through the process of developing the culturally sensitive intervention not merely as passive observer [17].

CONCLUSION

SBI followed by the daughter's birth is deeply embedded in the lack of reproductive freedom and can only be tackled by combining interventions focused upon behavioral and cultural practices. Focusing on these issues requires more than biomedical direction, henceforth counselling on healthy intervals is vital. The major and most intense issue is to control mothers' ability to decide birth spacing, and these involve husband and mother-in-law's dominance, cultural beliefs, religious misunderstandings and insufficient support for women in some communities.

Positive and long-lasting change demands a holistic move that combines health behavior change, gender equality promotion, social norm transformation, and active engagement of men and authoritative community actors. A wide range of gender sensitive and culturally deep rooted policies will only be able to improve maternal health indicators and impact women's right paving the pathway towards achieving SDG-3 and SDG-5 for health, well-being and gender equality.

ABBREVIATIONS

BISP: Benazir Income Support Program.

CPR: Contraceptive Prevalence Rate.

FP: Family Planning.

IPI: Inter-Pregnancy Interval.

LARCs: Long-Acting Reversible Contraceptives.

LHW: Lady Health Worker.

LWB: Low Birth Weight.

MNCH: Maternal, Neonatal and Child Health.

NMR: Neonatal Mortality Rate.

PDHS: Pakistan Demographic and Health Survey.

PPR: Parity Progression Ratio.

RMNCH: Reproductive Mother and Neonatal Child Health Care.

SDG: Sustainable Development Goals.

SRLB: Sex Ratio at Last Birth.

UNFPA: The United Nations Population Fund.

WHO: World Health Organization.

AUTHORS' CONTRIBUTION

Yawar Hussain: Conceptualization, Study Design, Methodology, Data analysis and interpretation.

Nida Shoaib: Conceptualization, Critical Review and revision the manuscript, Final approval, final proof to be published.

Hayat M. Khan: Methodology, Data analysis and interpretation, Writing draft.

Muhammad Yusuf: Conceptualization, Writing draft.

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