



## RESEARCH ARTICLE

# Expectant fathers' knowledge of maternal morbidity: a Sri Lankan experience [v1; ref status: indexed, <http://f1000r.es/zj>]

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## Abstract

**Background:** Male partners play an important and vital role in the decision-making process regarding pregnant women's health. The purpose of the present study was to assess the knowledge and awareness of expectant fathers about Gestational Diabetes Mellitus (GDM), Pregnancy Induced Hypertension (PIH), and anaemia during pregnancy.

**Methods:** A cross sectional descriptive study was carried out among expectant fathers whose partners were attending antenatal clinics at the Anuradhapura Teaching Hospital, Sri Lanka. All consenting participants were interviewed by investigators using an interviewer administered questionnaire to collect data on knowledge of risk factors, symptoms, complications and their control. Statistical analysis was performed using the Kruskal Wallis test.

**Results:** Of the 246 expectant fathers studied, 192 (78%) were aware of GDM, 183 (74.4%) and 154 (62.6%) were aware of PIH and anaemia during pregnancy, respectively. The total number of answers provided by expectant fathers ranged from 0 to 33 (of 41 questions). There were 44 fathers who could not answer even a single question. For GDM, anaemia, and PIH, the percentages of expectant fathers who failed to provide at least a single correct answer were 24.8%, 40.2%, and 31.3%, respectively. The median number of total correct answers provided increased steadily along with the average income (chi-square 31.24,  $p < 0.001$ ) and educational level (chi-square 33.57,  $p < 0.001$ ). Expectant fathers in the 25-34 age group had significantly higher scores, compared to younger and older fathers (chi-square 15.11,  $p = 0.001$ ). Fathers experiencing the second pregnancy of their spouses also had higher scores.

**Conclusions:** Expectant father's knowledge of the selected morbidities was limited. To improve maternal health, any health promotional programmes should include expectant fathers.

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## Introduction

The important role of men as the primary stakeholders of women's reproductive and sexual health has been widely accepted. In 1994, 20,000 United Nations delegates with member status pressed for men's involvement in reproductive health. The programme of action of the International Conference on Population and Development (ICPD) stressed men's shared responsibility for women's health<sup>1</sup>. Although the primary focus was on reducing violence against women and children, the resolution clearly declared that men should take responsibility for the empowerment of women.

Studies on family planning<sup>2,3</sup>, HIV/AIDS<sup>4</sup>, abortions<sup>4</sup> and breast-feeding<sup>5</sup> all provide clear evidence for the important and vital role of male partners in the decision-making process regarding women's health. Interventional studies on reproductive health programmes targeting either males or both sexes, compared to programmes targeting only females, have shown a significant effect on the reproductive health outcome of women. With this growing body of evidence, the concept of men as "gatekeepers" of women's health has been developed into a positive approach that includes men as partners in improving women's health.

Nevertheless, these involvements are often driven by the gender power relationships given to male partners in various cultures<sup>6</sup>. While reproductive health education and health promotion programmes that target adolescent boys and young men are acceptable in most parts of the world, shared responsibility for pregnancy-related matters heavily depends on the nature of gender roles within the society. In addition, fear of losing respect from peers, lack of communication skills, lack of knowledge, and perceptions of masculinity are also shown to have a major effect on this involvement. Despite having a lack of knowledge and involvement, men often dominate the decision-making processes related to pregnancy, especially in male-dominated South Asian cultures.

Studies in maternal health have shown that early interventions during the antenatal period have a major protective effect for medical conditions complicating pregnancy and direct pregnancy-related acute complications such as haemorrhage, rupture of the uterus, and obstructed labour. These interventions include early identification, early treatment and behaviour modifications.

However, screening tests and procedures for these conditions require resources, and early detection is not currently at an optimal level in most developing countries. We hypothesized that this could be partly due to a lack of awareness about maternal morbidity among pregnant women, and specifically among their partners who play a major role in decision-making. The knowledge of expectant fathers is vital to ensure that healthcare is sought early to prevent complications due to these conditions. The purpose of the present study was to assess the knowledge and awareness of expectant fathers about Gestational Diabetes Mellitus (GDM), Pregnancy Induced Hypertension (PIH), and anaemia during pregnancy.

## Methods

This study conformed to the Helsinki Declaration and to local legislation. All participants gave informed consent to participate in this study. Ethical clearance was obtained from the Research and Ethics

Committee, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.

The study was conducted in Anuradhapura, Sri Lanka, during November to December 2010. Anuradhapura district is situated in the North Central Province of Sri Lanka. The resident population is around 830,000<sup>7</sup>. Over the five years preceding this study the annual number of births reported from the district was around 16,000. The crude birth rate is 20.7/1000 population. Infant and neonatal mortality rates of Anuradhapura district (17.2/1000 live births (LB) and 11/1000 LB) are significantly higher than those reported in Sri Lankan national data, which are 11/1000 LB and 8.7/1000 LB, respectively<sup>8</sup>.

The study population for the present study included expectant fathers whose partners were attending antenatal clinics at the Anuradhapura Teaching Hospital. The study sample included the expectant fathers that were accompanying pregnant women to the antenatal clinics. The participants included fathers who were waiting during the clinic hours as well as the fathers who came to the clinic just to drop off the pregnant women at the clinic (this was a common practice and usually they returned around four hours later). The authors visited the antenatal clinics at the starting time and introduced themselves to expectant fathers, explained the objectives of the study, and handed out the self-administered questionnaires. The study sample for the present study included all expectant fathers visiting selected clinics during the study period. Since the study followed a non-probability sampling procedure, the optimal sample size was not calculated. However, it was hypothesized that if the 80% of the expectant fathers are aware of the selected morbidities and a simple random sampling procedure was followed, a minimum of 246 expectant fathers were required with 95% confidence limits and 5% absolute precision.

Variables for the study included basic socio-demographic variables and knowledge about GDM, PIH and anaemia. For each condition selected, expectant fathers were first asked about their awareness of the existence of certain disease conditions, for example, 'Are you aware that pregnant women could develop a condition called gestational diabetes mellitus?'. Then a selected set of questions on risk factors, clinical features, complications and preventative measures (primary and secondary) was included for all selected conditions (e.g., 'Which of the following could be risk factors for developing GDM?'). Only true risk factors, features and preventative measures were provided in the questionnaire. This approach was followed as a way of including health education and to avoid the possibility of giving incorrect messages through the survey. The variables were selected after discussion with medical, obstetric, and community medicine experts. The questionnaire was developed in English and translated into Sinhalese.

All demographic variables were analyzed as categorical variables. Answers to individual questions were presented as percentages. The total number of correct answers provided by participants was also reported as a percentage. The knowledge distribution was expected to have a skewed distribution because of the distribution of educational status in this population is also skewed, and non-parametric tests were carried out for significance testing.

## Results

The total number of expectant fathers studied was 246. The mean age of the participants was 30.2 years (standard deviation (SD) of 6.2 years) and the mean age of the pregnant mothers was 26.6 years (SD of 5.6 years). **Table 1** shows the demographic characteristics of the study sample.

The prevalence of GDM, PIH and anaemia during the present or previous pregnancies as reported by the fathers was 6.9% (n=17), 4.5% (n=11) and 11.4% (n=28), respectively. Of the 246 expectant fathers studied, 192 (78%) were aware of GDM, and 183 (74.4%) and 154 (62.6%) were aware of PIH and anaemia during pregnancy, respectively.

Of the risk factors listed in the questionnaire, a family history of GDM/diabetes mellitus (DM) was recognized by 48.8% of the study sample (**Table 2**). Of the respondents, 135 (54.9%) knew that increased frequency of urination was a common clinical presentation for GDM/DM. The probability of developing noninsulin-dependent diabetes mellitus (NIDDM) in later life as a complication of GDM was known to 98 (39.8%) respondents. Screening for GDM if risk factors were present was indicated as an appropriate intervention to control GDM by 30.5% (n=75) of participants.

**Table 1. Characteristics of 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and anaemia.**

Characteristic	n	(%)
Highest level of education		
Never been to school	7	2.8
Grade 1–5	14	5.7
Grade 6–10	53	21.5
GCE O/L	115	46.7
GCE A/L	50	20.3
Diploma/degree	7	2.8
Ethnicity		
Sinhalese	226	91.9
Tamils	5	2.0
Moor/Malay	15	6.1
Average monthly income (SLR)		
<5000	23	9.3
5001–15,000	134	54.5
>15,000	89	36.2
Parity of partner		
1	117	47.6
2	81	32.9
3	31	12.6
4	14	5.7
5	1	0.4
6	2	0.8

GCE O/L-General certificate in Education Ordinary Level.  
GCE A/L-General certificate in Education Advanced Level.

**Table 2. Percentage of expectant fathers who identified probable risk factors, clinical features, complications and control/preventive measures of GDM, PIH and anaemia.**

	n	%
<b>GDM Risk factors</b>		
Family history of DM	120	48.8
Age > 35 years	66	26.8
GDM in previous pregnancies	62	25.2
<b>GDM Clinical features</b>		
Increased frequency of urination	135	54.9
Abnormal increase of weight during gestational period	35	14.2
Polyphagia	46	18.7
Recurrent urinary tract infections	12	4.9
<b>GDM Complications</b>		
Diabetes in later in life	98	39.8
Delivery of an abnormally large baby	17	6.9
Diabetes in child	51	20.7
Neonatal problems	6	2.4
Obstructed labor	11	4.5
<b>GDM Control and prevention</b>		
Perform a blood glucose test in the booking visit/early in pregnancy	71	28.9
Perform specific blood tests if risk factors/clinical symptoms present	75	30.5
<b>Anaemia Risk factors</b>		
Pregnant mothers age > 35 years	66	26.8
Increased parity (more than 5 children)	11	4.5
Poor spacing (less than 2 years)	11	4.5
<b>Anaemia Clinical features</b>		
Lethargy	77	31.3
Severe headache	92	37.4
Pale lips/tongue	87	35.4
<b>Anaemia Complications</b>		
Stillbirths	36	14.6
Restriction of intra uterine growth	17	6.9
Low birth weight	14	5.7
Postpartum hemorrhage	65	26.4
<b>Anaemia Prevention</b>		
Adequate intake of iron rich food	123	50.0
Avoid taking tea, coffee or milk with meals	45	18.3
Add lime juice during preparation of green leaves	22	8.9
<b>PIH Risk factors</b>		
Age more than 40 years	53	21.5
Chronic hypertension	55	22.4
Chronic renal failure	3	1.2

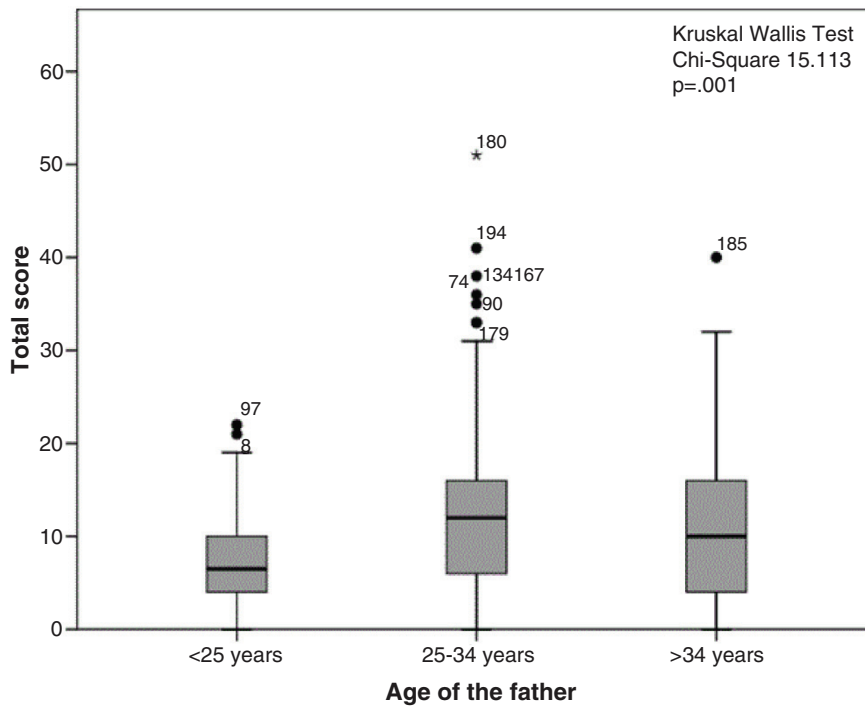
	n	%
<b>PIH Clinical features</b>		
Dizziness	143	58.1
Edema in heel or dorsal aspect of foot	51	20.7
High blood pressure	38	15.4
Double vision	20	8.1
<b>PIH Complications</b>		
Stillbirths	33	13.4
Bleeding during antenatal period	12	4.9
Pre-term delivery	19	7.7
Low birth weight	30	12.2
<b>PIH Control and prevention</b>		
Bed rest	18	7.3
Check blood pressure in every visit	105	42.7
Take proper medications for high blood pressure	115	46.7

Increasing maternal age was the risk factor most commonly recognized among expectant fathers as a risk factor for developing anaemia during pregnancy, which was reported by 26.8% (n=66) of the fathers. All other risk factors were known to less than 15% of

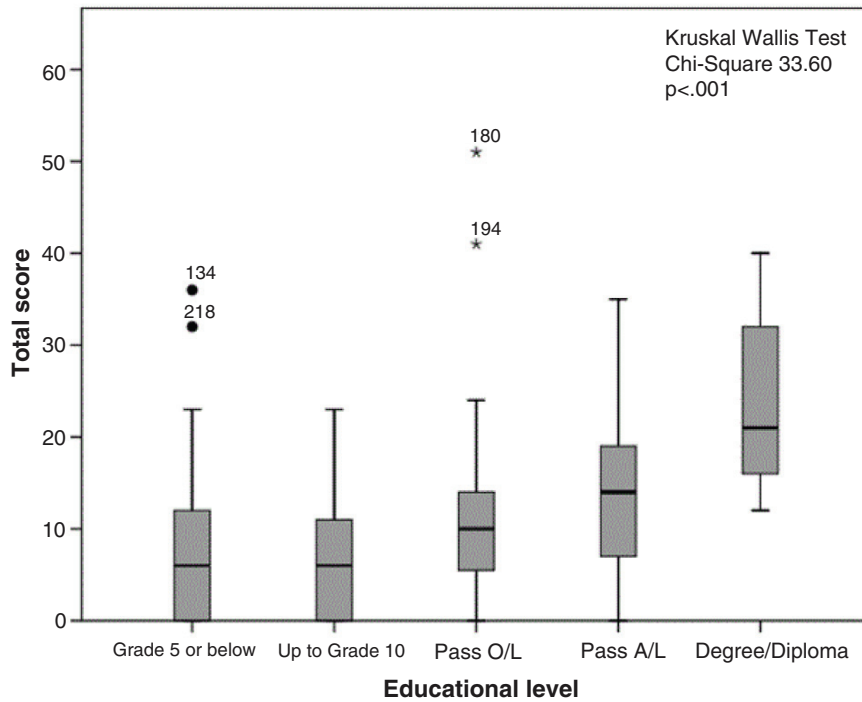
the respondents. However 92 fathers (37.4%) reported headache as a common clinical presentation of anaemia, and 65 (26.4%) were aware of the increased risk of postpartum haemorrhage. Half of the study sample responded that adding iron-rich food to the diet would help to prevent anaemia. Dizziness was identified as a probable symptom of PIH by 58.1% (n=143) participants. The most well known complication of PIH was stillbirth (13.4%). Nearly half of the participants agreed that PIH needed pharmaceutical intervention for proper control.

The total number of answers provided by the expectant fathers ranged from zero to 33 (of 41 questions). The distribution of the total scores showed a highly-skewed distribution with majority aggregating towards low scores. There were 44 fathers who could not answer even a single question. For GDM, anaemia, and PIH, the percentage of expectant fathers who failed to provide at least a single correct answer was 24.8%, 40.2%, and 31.3%, respectively.

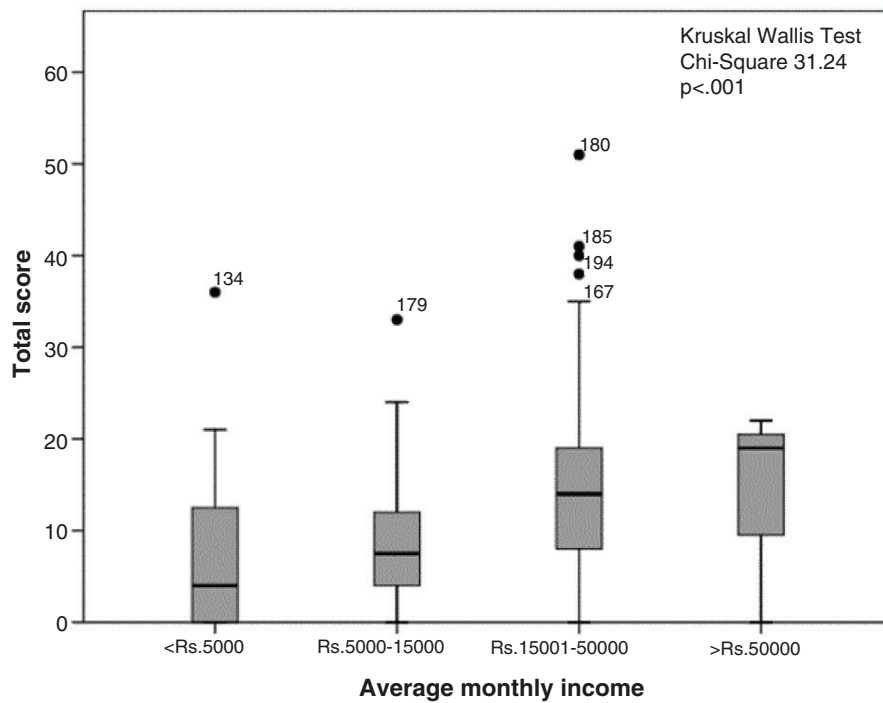
The distribution of score totals by socio-demographic characteristics is illustrated in Figure 1–Figure 5. Median scores increased steadily along with the average income and educational level. Expectant fathers in the 25–34 age group had significantly higher scores, compared to younger and older fathers. Fathers experiencing the second pregnancy of their spouses also had higher scores. Ethnic group was not associated with the scores obtained in this study sample.



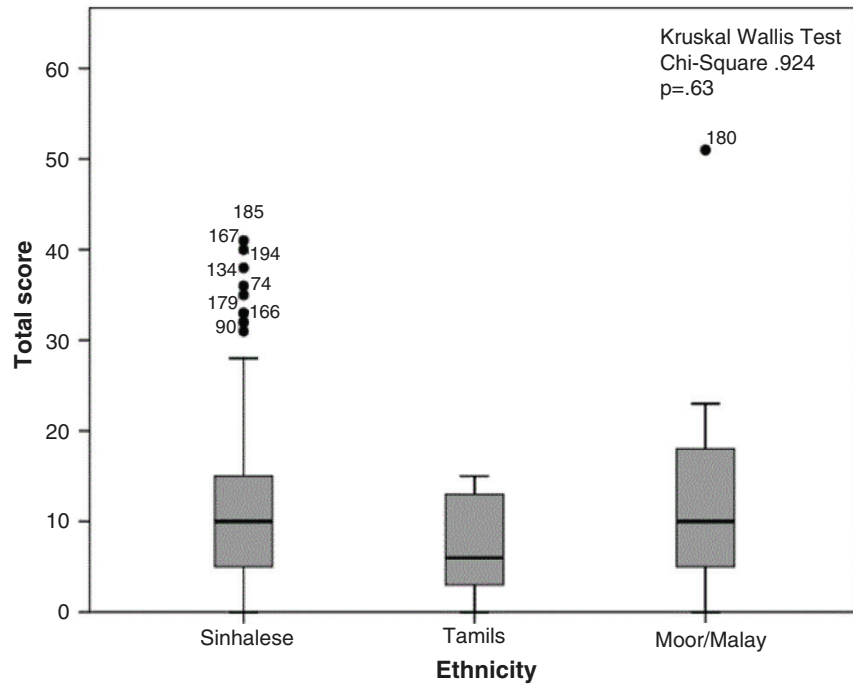
**Figure 1. Distribution of total score by age among 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and Anaemia.** (The box covers the Interquartile range (IQR); whiskers extend 1.5 IQR from the box; circles shows outliers lying between 1.5 to 3 IQR from box and the asterisk shows extremes more than 3 IQR from box. Numbers denotes the identification number for the study unit).



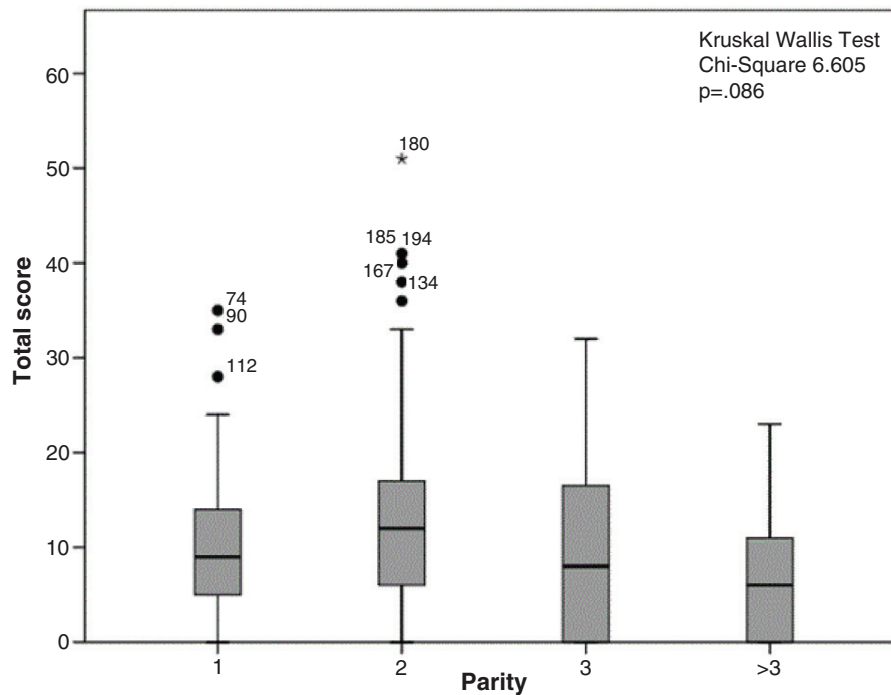
**Figure 2.** Distribution of total score by educational attainment among 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and Anaemia. (The box covers the Interquartile range (IQR); whiskers extend 1.5 IQR from the box; circles shows outliers lying between 1.5 to 3 IQR from box and the asterisk shows extremes more than 3 IQR from box. Numbers denotes the identification number for the study unit).



**Figure 3.** Distribution of total score by average monthly income among 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and Anaemia. (The box covers the Interquartile range (IQR); whiskers extend 1.5 IQR from the box; circles shows outliers lying between 1.5 to 3 IQR from box and the asterisk shows extremes more than 3 IQR from box. Numbers denotes the identification number for the study unit).



**Figure 4.** Distribution of total score by ethnicity among 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and Anaemia. (The box covers the Interquartile range (IQR); whiskers extend 1.5 IQR from the box; circles shows outliers lying between 1.5 to 3 IQR from box and the asterisk shows extremes more than 3 IQR from box. Numbers denotes the identification number for the study unit).



**Figure 5.** Distribution of total score by parity of the spouse among 246 expectant fathers who participated in the Knowledge Assessment Survey on GDM, PIH and Anaemia. (The box covers the Interquartile range (IQR); whiskers extend 1.5 IQR from the box; circles shows outliers lying between 1.5 to 3 IQR from box and the asterisk shows extremes more than 3 IQR from box. Numbers denotes the identification number for the study unit).

## Paternal knowledge of maternal morbidity in Sri Lanka

2 Data Files

<http://dx.doi.org/10.6084/m9.figshare.687996>

### Discussion

Pregnancy and childbirth have long been considered as a women's domain<sup>9</sup> by communities in which the involvement of male partners is minimal. Some studies even suggest that the number of expectant fathers seeking healthcare for their spouse's problems is lower than that of non-expectant fathers<sup>10</sup>. The reason for this could be due to the fact that women are more likely to persuade men to access healthcare rather than men being able to persuade women to seek help<sup>11</sup>. However, the intentions of both partners have shown to be a better predictor of health behavior<sup>12</sup>; thus the father's knowledge is vital in health-seeking behavior during pregnancy. The present study provides evidence to show that the expectant fathers have a limited knowledge of the main maternal morbidities. As this study showed that there was very poor knowledge, the results could not be interpreted, but there is definitely room for improvement.

Anemia was assumed to be a well-known condition among Sri Lankan people due to several factors. It is a major determinant in maternal health, and the public health programme in Sri Lanka has conducted endless campaigns to prevent this condition over the last few decades. In a study done in 2009–10 period, the prevalence of anemia among pregnant women in Anuradhapura was reported as 14%<sup>13</sup>. However, the present study shows that in Anuradhapura, 37.4% of fathers were not even aware that anemia could be a problem during pregnancy. This raises a major concern regarding the effectiveness of the present health education programmes. Either these programmes are only directed at pregnant mothers, or the programmes have failed to convey their essential messages.

Knowledge of GDM was slightly better than for other conditions, most likely due to the increasing community prevalence of diabetes in Sri Lanka, because the knowledge of the direct complications in pregnancy associated with GDM was poor. Prevalence of GDM in Sri Lanka is increasing, and a community-based study showed that around 10.3% of pregnant mothers in Sri Lanka experience GDM<sup>14</sup>. The present screening programme for GDM is not functioning well, due to a lack of facilities. If the community, especially expectant fathers, can be made aware of this condition, it will change care-seeking behavior and more cases will be detected and treated, thus preventing severe complications to both mother and child.

Eclampsia and PIH are listed as the second leading cause of maternal deaths in Sri Lanka. The condition accounts for a considerable proportion of hospitalizations, and the disease burden is very high. Routine blood pressure and urine albumin measurements are carried out in antenatal clinics as screening tests for PIH. In this study sample, risk factors and complications of PIH were known to a limited number of expectant fathers. However, dizziness, which is a non-specific sign of PIH, was known to more than 50% of the study sample as a clinical manifestation.

One major observation related to all three conditions was lack of knowledge about the complications of selected conditions. This lack of knowledge reduces the perception of risk due to these conditions. Risk perception is a core concept of health behavior, which is largely based on health literacy<sup>15</sup>. The study results suggest that the Sri Lankan maternal health programme should change their strategies in order to improve knowledge about these conditions.

Exploratory models have shown that health risk perception which is the basis for care-seeking depends on social class<sup>16</sup>, socioeconomic determinants, and the structure and practices of the health system<sup>17</sup>. Among pregnant mothers, knowledge about pregnancy risk factors<sup>18</sup> and GDM has been shown to be associated with educational status<sup>19</sup>. We also observed that level of education and income are positively associated with expectant fathers' knowledge about maternal morbidities.

Such inequalities in social factors seriously affect health and underpin all other determinants of health. Sri Lanka has shown remarkable success in overcoming these social inequalities in reducing maternal deaths. However, the maternal morbidity pattern still reveals a high level of inequality, and poor knowledge among expectant fathers could be one major determinant of the problem.

### Limitations

The study sample consisted of expectant fathers who were visiting clinics. These fathers may be more health conscious and not representative of the total population of expectant fathers. The knowledge observed may be higher than the actual prevailing knowledge. The majority of the individuals in the study sample were visiting antenatal clinics at the teaching hospital in Anuradhapura. These fathers might represent a group of fathers whose socioeconomic background was different from fathers living in rural areas. Some of the questions included in the questionnaire were testing a very high level of health literacy. However, the percentage of correct answers was only used as a subjective score in the interpretation.

### Conclusions

The limited level of knowledge among expectant fathers clearly shows room for the improvement of maternal health programmes. We suggest that safe motherhood programmes should have practical and operational strategies to include expectant fathers in maternal health promotion programmes.

### Consent

All participants gave informed consent to participate in this study. Ethical clearance was obtained from the Research and Ethics Committee, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.

### Author contributions

AW, GLW, MPW and GMW are second year medical undergraduates. They conceptualized the study and carried out data collection, processing and analysis. SBA is the supervisor of the study, guided the other authors and prepared the manuscript.



## Competing interests

No relevant competing interests were disclosed.

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## Appendix 1

# Questionnaire of paternal knowledge of maternal morbidity in Sri Lanka (English).

## Sheet 1:

### Questionnaire

- 1.1 What is your age?
- 1.2 What is your wife's age?
- 1.3 Highest educational level?
  - Never been to school
  - Grade 1–5
  - Grade 6–10
  - GCE O/L
  - GCE A/L
  - Diploma
  - Degree
  - Second degree
- 1.4 Monthly income (Sri Lankan Rupee):
  - <5000
  - 5001–15,000
  - 15,001–50,000
  - >50,000
- 1.5 City/Village:
- 1.6 Ethnic group:
  - Sinhala
  - Tamil
  - Muslim
  - Burger
- 1.7 The number of the present pregnancy of the mother
- 1.8 Has the mother developed any of the following diseases during the present or previous pregnancies:
  - Pregnancy-induced hypertension
  - Gestational diabetes mellitus
  - Anemia during pregnancy
- 1.9 Do you know that diabetes mellitus can occur in the gestational period?
  1. Yes If your answer is yes go to question 2.1
  2. No If your answer is no go to question 2.5

## Sheet 2:

2.1 Risk factors of gestational diabetes mellitus are:

- Family history of DM
- Age > 35 years
- GDM in previous pregnancies

2.2 Symptoms of gestational diabetes mellitus are:

- Increased frequency of urination
- Abnormal increase of weight during gestational period
- Polyphagia
- Recurrent urinary tract infections

2.3 The complications of gestational diabetes mellitus are:

- Diabetes in later in life
- Delivery of an abnormally large baby
- Diabetes in child
- Neonatal problems
- Obstructed labor

2.4 Preventive measures of gestational diabetes mellitus are:

- Perform a blood glucose test in the booking visit/early in pregnancy
- Perform specific blood tests if risk factors/clinical symptoms present

2.5 Do you know that anemia can occur in the gestational period?

- 1. Yes If your answer is yes go to question no 3.1
- 2. No If your answer is no go to question no 3.5

3.1 Risk factors of anemia during pregnancy are:

- Pregnant mothers age > 35 years
- Increased parity (more than 5 children)
- Poor spacing (less than 2 years)

3.2 Symptoms of anemia during pregnancy are:

- Lethargy
- Severe headache
- Pale lips/tongue

3.3 Complications of anemia during pregnancy are:

- Stillbirths
- Restriction of intra uterine growth
- Low birth weight
- Postpartum hemorrhage

3.4 Preventive measures of anemia during pregnancy are:

- Adequate intake of iron-rich food
- Avoid taking tea, coffee or milk with meals
- Add lime juice during preparation of green leaves

## Sheet 3:

3.5 Do you know that hypertension can occur in the gestational period?

1. Yes If your answer is yes go to question no 4.1
2. No Handover the questionnaire to the researchers.

4.1 Risk factors of pregnancy-induced hypertension are:

- Age > 40 years
- Chronic hypertension
- Chronic renal Failure

4.2 Symptoms of pregnancy-induced hypertension are:

- Dizziness
- Edema in heel or dorsal aspect of foot
- High blood pressure
- Double vision

4.3 The complications of pregnancy-induced hypertension are:

- Stillbirths
- Bleeding during antenatal period
- Pre-term delivery
- Low birth weight

4.4 Preventive measures of pregnancy-induced hypertension are:

- Bed rest
- Check blood pressure in every visit
- Take proper medications for high blood pressure

Thank you

Appendix 1

**Questionnaire of paternal knowledge of maternal morbidity in Sri Lanka (Sinhalese).**

**Sheet 1:**

**ගර්භණී සමයේ රෝග පිළිබඳ පියවරුන්ගේ දැනුම පිරික්සීමේ සමීක්ෂණය**

අප රජරට විශ්ව විද්‍යාලයේ වෛද්‍ය පීඨයේ වෛද්‍ය සිසුන් වන අතර එම පීඨයට අනුබද්ධ සමීක්ෂණයක් සඳහා, ගර්භණී සමයේ වැළඳිය හැකි රෝග පිළිබඳ ඔබගේ දැනුම ලබාගැනීමට බලාපොරොත්තු වෙමු.

---

ප්‍රශ්නාවලිය සම්පූර්ණ කිරීම සඳහා උපදෙස්  
 ප්‍රශ්න අංක 1.1 , 1.2 සහ 1.5 සඳහා අදාළ පිළිතුරු ප්‍රශ්නයට ඉදිරියෙන් ලියන්න  
 අනෙකුත් ප්‍රශ්න සඳහා පිළිතුරු ඉදිරිපස ඇති කොටුව තුළ ✓ ලකුණ යොදා දක්වන්න (එක ප්‍රශ්නයකට නිවැරදි පිළිතුරු එකකට වඩා තිබිය හැක).

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**සමාජීය තොරතුරු හා පසුබිම**

1.1 ඔබගේ අවසාන උපන්දිනයට ඔබගේ වයස අවුරුදු වලින් කීයද ?

---

1.2 අවසාන උපන්දිනයට ඔබගේ බිරිඳගේ වයස අවුරුදු වලින් කීයද ?

---

1.3 ඔබ ලැබූ ඉහලම අධ්‍යාපන මට්ටම දක්වන්න

1. පාසල් ගොස් නැත.	<input type="checkbox"/>
2. 1-5 ශ්‍රේණිය	<input type="checkbox"/>
3. 6-10 ශ්‍රේණිය	<input type="checkbox"/>
4. අ.පො.ස සා/පෙළ	<input type="checkbox"/>
5. අ.පො.ස උ/පෙළ	<input type="checkbox"/>
6. ඩිප්ලෝමා	<input type="checkbox"/>
7. උපාධි	<input type="checkbox"/>
8. පශ්චාත් උපාධි	<input type="checkbox"/>

---

1.4 ඔබගේ මාසික ආදායම ආසන්න වශයෙන් (රු.)

1. 5000ට අඩු	<input type="checkbox"/>
2. 5001-15 000 අතර	<input type="checkbox"/>
3. 15 001-50 000 අතර	<input type="checkbox"/>
4. 50 000ට වැඩි	<input type="checkbox"/>

---

1.5 ඔබ පදිංචිව සිටින නගරය කුමක්ද ?

---

1.6 ඔබගේ ජාතිය කුමක්ද ?

1. සිංහල	<input type="checkbox"/>
2. දෙමළ	<input type="checkbox"/>
3. මුස්ලිම්	<input type="checkbox"/>
4. බර්ගර්	<input type="checkbox"/>

---

1.7 මෙම ගර්භය ඔබගේ බිරිඳගේ කීවෙනි ගර්භයද ?

1. 1	<input type="checkbox"/>
2. 2	<input type="checkbox"/>
3. 3	<input type="checkbox"/>
4. 4	<input type="checkbox"/>
5. 5	<input type="checkbox"/>
6. 5 ට වැඩි	<input type="checkbox"/>

# Sheet 2:

1.8	ඔබගේ බිරිඳට මෙම ගර්භයේදී හෝ මීට ප්‍රථම ගර්භයකදී පහත රෝග වැළඳී තිබේද ?	
	1. දියවැඩියාව <input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
	2. රක්තගීනතාවය <input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
	3. අධික රුධිර පීඩනය <input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
<hr/>		
1.9	ගර්භණී සමය තුළ දියවැඩියාව රෝගී නත්වය වැළඳිය හැකි බව ඔබ දන්නේද ?	
	1. ඔව් <input style="width: 30px; height: 20px;" type="text"/> → ඔබගේ පිළිතුර ඔව් නම් ප්‍රශ්න අංක 2 ට යන්න	
	2. නැත <input style="width: 30px; height: 20px;" type="text"/> → ඔබගේ පිළිතුර නැත නම් ප්‍රශ්න අංක 2.5 ට යන්න	
<hr/>		
<b>2. පහත ප්‍රශ්න ගර්භණී සමය තුළ දැකිය හැකි දියවැඩියාව පිළිබඳවයි.</b>		
2.1	ගර්භණී සමය තුළ දියවැඩියාව වැඩිපුරම වැළඳීමට ඉඩකඩ ඇත්තේ	
	1. පවුලේ වෙනත් සාමාජිකයෙකුට හෝ සමීප ඥාතියෙකුට දියවැඩියාව වැළඳී තිබීම.	<input style="width: 30px; height: 20px;" type="text"/>
	2. වයස අවු. 35 ට වැඩි මවුවරුන්ට	
	3. මීට ප්‍රථම ගර්භයකදී දියවැඩියාව ඇති මවුවරුන්ට	
<hr/>		
2.2	ගර්භණී සමයේ දියවැඩියාව වැළඳීමේ රෝග ලක්ෂණ විය හැක්කේ	
	1. මුත්‍රාතිරීමට අවශ්‍ය වාර ගණන වැඩිවීම.	<input style="width: 30px; height: 20px;" type="text"/>
	2. ගර්භණී සමය තුළ අධික ලෙස බර වැඩිවීම.	
	3. අධික ලෙස පිපාසය ඇතිවීම	
	4. ගර්භණී සමය තුළ යෝනි මාර්ගයේ කැසීම් සහ ශ්‍රාවයන් පිටවීම	
<hr/>		
2.3	ගර්භණී සමය තුළ ඇති වන දියවැඩියාව නිසා ඇතිවිය හැකි සංකූලතා වනුයේ	
	1. මවට පසුකාලීනව දියවැඩියාව වැළඳීමට ඉඩ ඇති බව	<input style="width: 30px; height: 20px;" type="text"/>
	2. දරුවා අසාමාන්‍ය ලෙස විශාල වීම	
	3. දරුවාට පසුකාලීනව දියවැඩියාව වැළඳීම	
	4. ඇළුන උපන් බිලිඳාගේ සංකූලතා	
	5. ප්‍රසූතියේදී ඇතිවන අපහසුතා	
<hr/>		
2.4	ගර්භණී සමය තුළ ඇතිවන දියවැඩියාව පාලනය කරගත හැක්කේ / මග හරවා ගත හැක්කේ	
	1. පළමු ප්‍රසව සායනය තුළදීම රුධිර පරීක්ෂණයක් සිදුකර ගැනීම (FBS / PPBS)	<input style="width: 30px; height: 20px;" type="text"/>
	2. ගර්භණී සමයේ දියවැඩියාව වැළඳීම සතුවන අවදානම් සාධක තිබෙනවා නම් මාස 4 අවසානයේ දියවැඩියාව පිළිබඳ රුධිර පරීක්ෂණ (OGTT) සිදුකිරීම	
<hr/>		
2.5	ගර්භණී සමය තුළ නිරක්තිය / රක්තගීනතාවය ඇතිවිය හැකි බව ඔබ දන්නේද	
	ඔව් <input style="width: 30px; height: 20px;" type="text"/> - ඔබගේ පිළිතුර ඔව් නම් ප්‍රශ්න අංක 3 වෙත යන්න.	
	නැත <input style="width: 30px; height: 20px;" type="text"/> - ඔබගේ පිළිතුර නැත නම් ප්‍රශ්න අංක 3.5 වෙත යන්න.	
<hr/>		
<b>03. පහත ප්‍රශ්න ගර්භණී සමය තුළ දැකිය හැකි රක්තගීනතාවය පිළිබඳවයි.</b>		
3.1	ගර්භණී සමය තුළ රක්තගීනතාවය වැළඳීමට වඩාත්ම ඉඩ ඇත්තේ	
	1. වයස අවු. 35 ට වැඩි මවු වරුන්ට	<input style="width: 30px; height: 20px;" type="text"/>
	2. ගැබ්ගැනීම් වාර ගණන 5 ට වැඩි වීම	

# Sheet 3:

3.	දුරුවන් අතර උපන් පරතරය අඩුම තරමින් අවු 2 ක් නොවීම.	<input type="checkbox"/>
3.2	<p>ගර්භණී සමය තුළ වැළඳෙන රක්තභීනතාවයේ රෝග ලක්ෂණ විය හැක්කේ</p> <ol style="list-style-type: none"> <li>1. ගෙදර පොර වැඩ කටයුතු වලදී ඉක්මනින් මහන්සියට පත්වීම</li> <li>2. අධික හිසරදය</li> <li>3. තොල්, නියපොතු, ඇසිපිය යට සුදුමැලි වීම</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.3	<p>ගර්භණී සමය තුළ ඇතිවන රක්තභීනතාවයේ සංකූලතා වනුයේ</p> <ol style="list-style-type: none"> <li>1. මළදරු උපන්</li> <li>2. ගර්භණී සමය තුළ කළලයේ වර්ධනය බාල වීම</li> <li>3. දරු වාගේ උපන් බර අඩු වීම</li> <li>4. දරු උපතින් පසු සිදුවන සාමාන්‍ය රුධිර වහනයකින් වුවද මව අසාධ්‍ය තත්වයට පත් වීම</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.4	<p>ගර්භණී සමය තුළ රක්තභීනතාවය වැළඳීම අවම කිරීමට ඔබට ගත හැකි ක්‍රියා මාර්ග වන්නේ</p> <ol style="list-style-type: none"> <li>1. පළා වර්ග පිලියෙල කිරීමේදී ඊට දෙහියුෂ ස්වල්පයක් එක් කිරීම</li> <li>2. මස්, මාළු, ගොටුකොළ, සෝයා, මුං වැනි යකඩ අඩංගු ආහාර ආහාරයට ගැනීම</li> <li>3. ප්‍රධාන ආහාර වේලේ ගැනීමට පැය 2 කට පෙර හෝ පසු තේ, කෝපි, කිරි වැනි පාන වර්ග නොගැනීම.</li> </ol>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3.5	<p>ගර්භණී සමය තුළ අධිරුධිර පීඩනය ඇතිවිය හැකි බව ඔබ දැන සිටියේ ද?</p> <p>ඔව් - ඔබගේ පිලිතුරු ඔව් නම් ප්‍රශ්න අංක 3 වෙත යන්න.</p> <p>නැත - ඔබගේ පිලිතුරු නැත නම් මෙම ප්‍රශ්නාවලිය සම්බන්ධයෙන් භාර දෙන්න.</p>	

# Sheet 4:

<b>04. පහත ප්‍රශ්න ගර්භණී සමය තුළ දැකිය හැකි අධිරුධිර පීඩනය පිළිබඳවය.</b>	
4.1	ගර්භණී සමය තුළ ඇතිවන අධිරුධිර පීඩනය සඳහා හේතු විය හැක්කේ 1. ගැබ්ණී මව වයස අවුරුදු 40 ට අධික වීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 2. දිගු කාලීන අධිරුධිර පීඩනය <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 3. දිගුකාලීන වකුඩු ආබාධ <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/>
4.2	ගර්භණී සමය තුළ ඇතිවන අධිරුධිර පීඩනයේ රෝග ලක්ෂණ විය හැක්කේ 1. කරකැවිල්ල <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 2. දෙපතල් වල විලුඹ සහ උඩු පතුලේ ඉදිමීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 3. අධික රුධිර පීඩනය <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 4. එකම වස්තුව දෙකක් වී පෙනීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/>
4.3	ගර්භණී සමය තුළ ඇතිවන අධික රුධිර පීඩනය නිසා ඇතිවිය හැකි සංකූලතා වනුයේ 1. මල දරු උපත් <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 2. කළලයේ බන්ධය නිසම කාලයට පුර්වයෙන් ගර්භාශයෙන් වෙන් වීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 3. නියමිත කාලයට පෙර දරු ප්‍රසූතිය සිදුවීම (සති 36 - 38) <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 4. අඩු උපත් බර සහිත දරුවන් බිහිවීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/>
4.4	ගර්භණී සමය තුළ ඇතිවන අධික රුධිර පීඩන අවම පාලනය කර ගත හැක්කේ 1. විවේක ගැනීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 2. සෑම සායන වාරයකදීම සුදුසුකම් ලද අයෙකු ලබා රුධිර පීඩනය පරීක්ෂා කරවාගැනීම. <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/> 3. අධික රුධිර පීඩනය සඳහා නියමිත ඖෂධ වෛද්‍ය උපදෙස් අනුව නොකඩවා ලබා ගැනීම <input style="width: 30px; height: 20px; margin-left: 10px;" type="text"/>
<b>ස්තූතියි !!!!</b>	



# Open Peer Review

Current Referee Status:



Version 1

Referee Report 17 March 2014

doi:10.5256/f1000research.1279.r4139



**Shahirose Premji**

Faculty of Nursing, University of Calgary, Calgary, Canada

I wish to extend my appreciation for the invitation to referee this important study which examines expectant fathers' knowledge and awareness about pregnancy complications – gestational diabetes mellitus, pregnancy-induced hypertension, and anaemia – that may impact health outcomes of both the mother and baby. The relevance of the work undertaken is well articulated in the introduction and the authors used a non-experimental descriptive research design to assess expectant fathers' knowledge and awareness about selected morbidities. Fathers were recruited from antenatal clinics at the Anuradhapura Teaching Hospital. Eighteen percent (44 of 246) of expectant fathers were unable to answer a single question (awareness and knowledge). The remaining fathers (82%) demonstrated varied levels of awareness about gestational diabetes mellitus (78%), pregnancy-induced hypertension (74%), and anaemia (63%) and knowledge regarding risk factors, signs and symptoms, associated complications, and management strategies. The findings have implications for Sri Lankan maternal health programme intent to improve health literacy of the population and strategies to promote health seeking behaviors.

## Major Comments

### Introduction:

- **Hypothesis:** The statement leading to the hypothesis emphasizes health inequities (i.e. lack of resources related to screening and managing morbidities); however this is not the focus of the study. Moreover, the hypothesis would suggest that the authors wish to explain why some expectant mothers and fathers seek care while other don't; asserting that lack of knowledge and awareness may be one factor. The way in which the hypothesis is stated would suggest that the study examines both expectant mothers' and expectant fathers' knowledge and awareness about selected morbidities. The descriptive nature of the study would suggest that you want to determine whether expectant fathers whose partners are seeking care have increased knowledge and awareness given their role in decision making about seeking care.

### Design and Methods:

- **Setting:** Provide a more detailed description of the study setting to determine how representative the sample is of the population seeking care at this hospital. For example, whether it is common practice for expectant fathers to accompany their partner (i.e. wait with them or drop them off) to the antenatal clinic, and the average number of women who attend the clinic per day, to give perspective for the short duration of recruitment (November to December 2010).

- **Recruitment:** How did you enroll the expectant fathers who dropped off their partners at the clinic? Your demographic description should indicate the numbers of expectant fathers who were waiting with their partners and the number who were dropping their partner off. Provide more detail related to the recruitment process (e.g. the number who refused to participate, language use, if unable to sign how was this managed, what were potential risks/harms and how did you manage these?).
- **Questionnaire:** Provide more details. The English version of the questionnaire uses medical terms (e.g., gestational diabetes mellitus, Polyphagia) which participants may not be familiar with. For example, in some cultures diabetes is referred to as sugar in the blood. When translating the English to Sinhalese, was the language appropriately changed? What was the level of readability in the Sinhalese language? Was the questionnaire back-translated to English to ensure language equivalency? Was the questionnaire piloted? Given the variability in literacy (i.e., levels of education) within the community, how did participants complete the questionnaire? For instance, did the researcher or research assistant assist by using an interview format? On page 3 it is stated that “The total number of answers provided by the expectant fathers ranged from zero to 33 (of 41 questions)”. The questionnaire shared in Appendix 1 only has 23 questions. Explain how each of the questions, particularly those with multiple components (e.g., risk factors) was presented and how responses were elicited.

**Analysis:**

- You indicate “All demographic variables were analysed as categorical variables”; however report the mean age of participants and their partners. Were data normally distributed to report means? Revise this statement accordingly.

**Results:**

- First paragraph: provide a brief description of your sample by highlighted distinct characteristics. For instance, for most women this was their first pregnancy. In the discussion comment on how your sample compares to the general population (i.e., how representative is it). Is it mostly first time mothers who access antenatal clinics?
- Did all expectant fathers provide demographic information? If so, include n of the sample in the table.
- You provide data on the prevalence of gestational diabetes mellitus, pregnancy induced hypertension, and anaemia as reported by fathers (page 3 second paragraph of results). There are two issues with this statement: (1) prevalence refers to the proportion of a population. Your study used a convenience sample. (2) The estimate was based on fathers’ report but many of the fathers were not able to recognize these morbidities. Please clarify.
- Findings: need to be presented more clearly.
  - The missing data needs to be accounted for in the tables and explanations provided in the text.
  - Please explain how the percentages were calculated. There are instances when the total percent count is over 100% (e.g. GDM risk factors) and in some instance well below 100% (e.g. GDM complications).

- Did all participants answer questions related to demographic characteristics? If so, an important consideration would be describing how similar or different the demographic characteristics were between respondents and non-respondents.
- Examination of the distribution of responses based on specific demographic variables: Explain what you mean by “score totals” and how this score was determined? Given the multiple comparisons being made, you are likely to find a significant difference by chance (i.e., Type 1 error). Consider the p value adjustments required for these multiple comparisons. These findings should be interpreted with caution given the nature of the questionnaire (i.e., medical terms used), the type of design, and number of participants who were able to respond.

**Discussion:**

- The first paragraph discusses expectant fathers seeking health care and non-expectant fathers seeking health care, which is not the focus of your study. Delete.
- Needs more depth and breadth by addressing:
  - Findings regarding awareness: was this what you expected given the policy changes (i.e., campaigns in the country) over the last 5 years? Why may the findings not be in keeping with what you expected?
  - Lack of knowledge may reduce risk appraisal which guides health behaviour (i.e. seeking care); hence how do you explain the health care seeking behaviour of these couples? What else may be guiding their health seeking behaviors? The World Health Organization recommends 4 antenatal clinic visits – what is the potential implication of the finding of your study with regarding to compliance to this recommendation.
  - Knowledge about selected morbidities: discuss every aspect evaluated (e.g. risk factors, signs and symptoms, etc.). What can be gleaned from these findings? Are similarities and differences? Would you expect the population have knowledge about management?
  - Discuss the role of parity with reference to health seeking behaviors and knowledge or health literacy.
  - Be careful with the inferences you are making. For example, improving knowledge will improve health seeking behavior. Your findings suggest that expectant fathers seek health care for their pregnant spouse even though they don't have the knowledge.
  - Refocus the discussion with emphasis on the findings and implications for practice, future research and policy.

**Limitations:**

1. Consider revising after you have addressed the above points. For instance, if medical terms were used, this may explain why so many respondents were not able to complete even one question.

**Quality of written English:**

- Results and Discussion: a few sentences which are not clear. Page 3, last paragraph has a couple of sentences which are not clear. Page 7, discussion, first paragraph, second sentence and last

sentence in the paragraph. Page 7, last paragraph beginning knowledge of GDM delete “because the knowledge of the direct complications in pregnancy associated with GDM was poor” as this does not explain the finding. Was there another point you were trying to make? Please clarify. Page 8, limitations, last sentence in the paragraph – not sure what you mean.

**Minor Comments:**

- **Title:** insert “selected” after knowledge of.
- **Abstract:** The results section may need to be modified after you have addressed the methodological issues.
- **Language:** change developing country to lower middle income (The World Bank income level categorization for Sri Lanka).
- **Tables and Figures:** Ensure all abbreviations are written out in full at the bottom.
- **Figures 1-5:** present in the order in which they are discussed in the text.

**I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

**Competing Interests:** No competing interests were disclosed.

Referee Report 18 July 2013

doi:10.5256/f1000research.1279.r1119



**Tabassum Firoz**

University of British Columbia, Vancouver, BC, Canada

This is an important body of work as men's participation is critical in achieving good maternal health outcomes.

I would caution the authors from making a statement that men are the 'primary stakeholders' or 'gatekeepers' in women's health. While you make the point that is certainly true in many societies, it important to keep in mind that how women access care is more complex. The root causes which are economic and social go beyond men.

A minor point about semantics: I would avoid using PIH- either use gestational hypertension (or pre-eclampsia- I could not tell from the questions what you were targeting as these two entities are very different while being on the same spectrum). Secondly, instead of 'developing countries', I would suggest 'low income countries'.

I am concerned that the language and the level of knowledge required to understand the questionnaire is indeed very high. You do rightfully point this out. Can you explain why you chose such a sophisticated level? How does this relate back to your objective of assessing knowledge around morbidity? The questions are at the level a health care professional might answer. A small percentage of your sample didn't even have any education! Most questionnaires should be targeted to a grade 6 (by North American

standards) level.

From a public health perspective, the key messages should be to recognize that a woman is sick (perhaps even have a certain condition in mind) and to know what actions should be taken to prevent and/or treat the condition. Most certainly, the key is to seek care as soon as illness is recognized. I don't think the questions reflect this.

Secondly, some of the choices are wrong- for example, anemia does not present with severe headache. In fact, many serious conditions in pregnancy present with headache and this gives the impression that a less severe condition like anemia can present like this. Heel edema/ankle edema may be present in normal pregnant women and therefore, it is not a good choice. Bed rest is actually not recommended for the hypertensive disorders of pregnancy.

It would be interesting to know how men whose partners previously had these conditions scored compared to men whose partners did not have these conditions.

I think the authors need to revise the discussion section with more limitations and as well propose how this knowledge can be used.

**I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

**Competing Interests:** No competing interests were disclosed.

Referee Report 01 July 2013

doi:[10.5256/f1000research.1279.r1033](https://doi.org/10.5256/f1000research.1279.r1033)



**Laxmi Baxi**

Department of Obstetrics and Gynecology, Columbia University Medical Center, New York, NY, USA

This is an interesting manuscript, which addresses the awareness of expectant fathers about health issues in expectant mothers. Clearly, health issues in pre-pregnant state and during pregnancy contribute towards compromised maternal and neonatal-infant health including mortality and such information is not commonly addressed in the literature. The authors have mentioned that this issue was addressed at an international conference, which was focused at reducing maternal and perinatal-infant morbidity and mortality.

**Suggested revisions:**

- Although, the authors describe and analyze these data at great length, the manuscript is conspicuous by the absence of similar data about the expectant mothers from the same group. If they do not have such information or have not collected the same, it would be advisable to include historical data of this population or similar population, as collected by them or others in the literature.
- The authors have also reported that the neonatal and infant mortality was higher in the area, where the study was conducted, compared to the rest of Sri Lanka. Does this information address this disparity?

- It is not clear whether the fathers were aware of, or given information as to how this knowledge and these health issues would affect outcomes of these pregnancies, health of other members of their families and future health of their children - the authors should specify this.
- Do authors have any knowledge about the number or percentage of patients that attended these clinics in their pregnancies?
- In limitation of this study authors have addressed the issue of fathers who attend the clinic and those who do not. For those who do not, is it because they have limited resources and less knowledge?
- The authors have addressed three important issues: anemia, diabetes and eclampsia. How do they propose to use this information and implement changes if necessary, to educate the population by various measures including social awareness, impact on society, country and thus improve maternal and child health? They indeed mention that the Sri Lankan maternal health program study should change their strategy in order to improve knowledge about these conditions - this strategy should be a part of multi-prong approach.

**I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

***Competing Interests:*** No competing interests were disclosed.

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