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‘Masking’ the unmasked

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Cannabis, commonly known as Ganja, is an addictive substance with strong evidence for many of its adverse effects on health (1). It is an illegal substance in the world other than in Uruguay, Canada and a few states in the USA. However, a striking global campaign for legalising cannabis is in operation at present to convince governments and other stakeholders that it should be legal, available and accessible to people, based on the argument that it is ‘less harmful’ than other illegal drugs and tobacco. This well-funded ‘Legalise Cannabis Campaign’, backed by known vectors of ill health like multi-national tobacco and fizzy drink industries, is accused of propagating myths, distorted facts and half-truths to convince policy makers to achieve its goals (2). As public health professionals and powerful stakeholders in public health policy processes, do we possess an updated knowledge on cannabis and its impacts? Can we identify myths from facts related to cannabis?

This issue’s cover is on an image adapted from the ‘Annual Short Drama Competition’ organized by Alcohol and Drug Information Centre (ADIC) in collaboration with the National Youth Services Council (NYSC) under the theme, Innovative Approaches on Alcohol and Tobacco Prevention for Youth. The colourful mask concealing the well-known dangers of cannabis as portrayed in the image, is creating confusion and doubt related to the science on its harm, hence the theme of cover story, ‘masking’ the unmasked.

The facts on adverse effects of cannabis remain the same and uncontested. Even today, it remains true that it can induce tachycardia and hypertension, and even cause sudden death by doing so (3). It remains true that smoking cannabis will give all the adverse effects related to smoking tobacco, simply because it is not the leaf in the cigarette per se that causes the effects, but inhalation and dissemination of a diverse range of toxins via the two efficient organ systems highly adapted to inhale and disseminate oxygen to sustain life in the human body (1, 3-4). It remains true that it has the potential to cause psychosis, especially among young users, increasing their risk of schizophrenia. It remains true that cannabis not only increases the risk for mental disorders but also affects higher cognitive functions including memory, learning capacity and productivity potential of young users (1). There are other intriguing facts about cannabis that are not highlighted by the “Legalise Cannabis” campaign.
It is a fact that Cannabis in the market today is genetically modified for a higher shelf-life and higher addiction potential, so that the industry can be more profitable. Cannabis found in the market had recorded tetrahydrocannabinol (THC) levels even as high as 35%, compared to the naturally occurring level of less than 2%. Thus, an important fact to be aware of is that cannabis in the market today is quite different from what had been prescribed by the traditional medical practitioners or what was smoked in 1970’s within the 'hippie' culture (5). Ironically, the few states in USA which have legalised cannabis use have started reporting on the serious public health related adverse effects emerging due to increased access and use, brought on by legalisation. The number and proportion of road traffic accidents have increased due to driving under the influence of cannabis and these trends keep on rising. It is proven that cannabis cause impairment of driving skills (6). Child hospital admissions due to accidental as well as non-accidental cannabis poisoning have also been reported due to increased access to this substance at home and school.

As cigarettes are now going ‘out-of-fashion’, the multi-national tobacco companies are looking for alternatives to stop the habit of smoking from dying, in order to sustain their market share (2). In line, a tobacco industry funded movement to legalise cannabis is evident around the world. This campaign advocates cannabis as a herbal drug to be used in the form of medicine including in Ayurveda practice, and is largely dependent on this revenue. However, what the lobbyists of this campaign ‘forget’ to mention is that when any natural compound/substance is used as a medicine, it should be done solely for that purpose, prepared in purified forms, in recommended doses and exclusively for indications relevant in those suffering from specific disease categories. Legalising this highly addictive, psychoactive substance would give it the “license to kill”, the same licence that we have given to the tobacco industry years ago, to destroy the lives of millions of users and non-users around the world.

**References**


The public in public health

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The ambit and thrust of public health are not as easy to delineate as of some other specialities (1). Public health professionals may therefore do well to ask their colleagues, from time to time, how they perceive their role in promoting public health. They will then discover how many mention ‘engaging and encouraging members of the public to improve their own health’, or something on those lines. A health promotional view of things (2) suggests that the public should play a major role in this task. But there probably will be some professionals and policy makers who’d doubt the benefit of this. Examining how Sri Lanka has succeeded in reducing tobacco consumption over the last few decades should help reduce their scepticism.

The total number of cigarettes legally sold in Sri Lanka has shown a marked decline over the last quarter century or so, from about 5.2 billion sticks in 1995 to less than 3.2 billion last year (3). Population increases and the more active distribution and marketing in areas where the armed conflict had previously been an obstacle, should have generated the opposite trend. This trend predates the important policy measures that came into force with the passing of the National Tobacco and Alcohol Authority Act (4) and is not explained by any decline in the affordability of cigarettes. There are sufficient grounds to say that enlightened public action was a major, and perhaps the biggest, driver of the trend (5). Public interest and involvement probably contributed to the passage of the ‘NATA Act’, following the WHO ‘Framework Convention on Tobacco Control’ (6), and to the scope of the legislation being broadened to subject alcohol too to the same provisions as tobacco – an achievement not seen anywhere else in the world.

Who was the public?

‘The public’ is of course everyone. In this case, it was basically the critical mass of scattered people needed to precipitate change. Contributions from several sources multiplied their separate impacts. Nobody owned the enterprise and the disparate groups of people involved felt it was up to them – rather like how the ‘yellow vests’ in France operate today and the ‘occupy’ movement in the US tried a few years ago. The movement led by school children to generate action to forestall climate disaster is also growing on similar lines – this time global in ambition. All ownerless actions – in other words, owned by the public at large.

Although ‘the public’ is enormous and amorphous, interest and action generated by small groups of people in communication with each other can rapidly grow – to become public property. Such groups could be said to constitute ‘communities’. In matters of social change, these energized groups are initially outside the public mainstream, in a sense. But they are not opposed to wider society. The real opponents are the forces that covertly influence the ‘wider public’ – by manipulating shared desires and opinions through mass media; avenues of entertainment and leisure; news, information and academic sources and varied ‘inter-
personal’ communications through individuals and agencies put in place for that very purpose.

So, what did this public do?

My view is that the public’s success was due to different groups doing different things independently. They had time to learn from what worked, whilst doing their thing. They found, for instance, that lobbying for government action and policy measures initially led nowhere. In those early days, when no opposing body could hope to counter the overwhelming power of the tobacco trade, attempts to establish policies to promote the public’s health were near impossible. There was, for instance, a tobacco industry representative even in the toothless committee dealing with tobacco control measures in the Health Department. Public representatives soon learned to ignore such official forums and concentrate on where they could produce a change.

Second, people learned to recognize determinants and address those they could effectively influence. Since it made sense to take on the vector, this determinant was pursued with great enthusiasm. Seeing what one group did to counter a tobacco trade action, made others want to emulate and outdo them. These initiatives developed further, by active members of the public copying what the trade did to counter them and using these tactics back on the vector. An example was the targeting and tarnishing of individuals active in tobacco control. While specific individuals working to reduce the spread of tobacco could be targeted, the tobacco trade (and its proxies) remained an impersonal entity, untouched by any counter activity. Shifting the blame from the tobacco trade in general to specific individuals, for the killing that cigarettes caused, was an important ingredient of success. Individuals who were in responsible positions or who were most active in spreading poisonous tobacco propaganda were identified by name. Since the majority of those working for the trade were people simply trapped in their jobs and unable to express their humane impulses due to the terms of their employment contracts, this shift of focus to specific vicious individuals was particularly salutary.

Another determinant that the public understood was the image of smoking. Helping young people to identify and reverse the various strategies used by the trade to promote a ‘glamorous or cool image’ was highly effective. Youth, and sometimes even children, were seen to be active, as part of the public. The image of smoking, especially among youth, changed steadily from ‘bad, risky but cool’ towards being seen as ‘silly, unattractive and old-fashioned’. Smokers who were previously seen as being non-conformist and adventurous began to be seen more as failures – attempting to cover their deficiencies and low self-esteem behind a veil of smoke.

Communities campaigning for change found that most people were sensitive to the economic harm resulting from smoking. The extent of this harm was formally studied and reported only later (7-8) and these may even have been a result of the public awareness percolating to professional circles. The public readily took on the task of trying to minimize tobacco (and alcohol) expenditures as something that was more immediately felt than long term health harm.

Local action, global potential

Success in any enterprise is enhanced when those involved see positive outcomes from their efforts. Given the small-scale and scope of actions, it was possible for people to notice their successes. A change in attitude or conduct of the local tobacco retailer, a shift in how students of a particular school or village viewed smoking and the resistance to tobacco distributors who visited local retailers to replenish cigarette stocks are examples of short-term progress that people could see. When opportunities arose for them to share, the groups were keen to present their various successes as well as to learn from the successful approaches of others.

The development of sensitive indicators by which people involved could judge how they were progressing was probably a major motivator of continued actions, and these then led to more distant impacts being assessed. Groups of youth would, for example, monitor the number of cigarettes sold in a given week in their village outlet. Calculating the cash saved for the community served not only as an indicator but also as a stimulus to further effort.

What ‘people action’ created in circumscribed local settings led to a growing consciousness among
the wider public about the viciousness of a trade that knowingly marketed a product which killed around half of its faithful customers. The customers too shifted away from being easily duped victims who gullibly supported their murderous supplier. I suspect that there was a shift in attitude within the tobacco trade too. Most of those employed in the trade had hitherto been unaware of the extent of harm caused by their product, taking cover behind the slogan that it was a legal and legitimate business. Many employees probably did not even know how their own business targeted young people. Their awakening may have contributed to dampening the company’s vicious vigour.

Other examples

Reducing smoking is only one example of a public health achievement in which the Sri Lankan public played a substantial role. Alcohol consumption is another area – where public action had brought about significant changes in numerous settings. In addition, people in various scattered communities successfully challenged the use of ‘drunkenness’ as an excuse for being rude or aggressive. A further area where public action played a strong role was in preventing suicides. A component of the National Policy on Suicide (9) that began to be implemented in the late 1990s required that the mass media stop reporting suicides in ways that could encourage further harm – such as through ‘copycat’ acts by vulnerable individuals. The level to which different media agencies cooperated differed considerably. Television channels and newspapers that were insistent in continuing their previous forms of reporting were directly addressed by well-informed and committed members of the public – and this contributed strongly to these media agencies too eventually modifying their previous stance. A further component of the suicide prevention effort was reducing easy access to highly lethal pesticides. Engagement of the public resulted in enthusiastic individuals taking the initiative (in many paddy cultivation areas) to implement their own measures in this regard. The notable reduction in suicides since then was undoubtedly driven by these public efforts too. More recently there are many examples of pubic action leading to gains in chronic non-communicable disease prevention (10-11).

Lessons and conclusions

The public may be the best engine to drive many, or most, public health initiatives. For this potential to be fulfilled, an approach that allows communities to lead, where relevant, is needed. People may then understand, analyse and address the determinants that they can change. Creating public awareness is, alone, rarely sufficient to engage and enthuse people to take the lead in this kind of initiative. To nurture such public processes, we have to acquire not only the skills needed. A supportive mindset too is required. This is present in each of us to different degrees. A collective effort can enhance the further development of this mindset.

Should the public health community become more active in engaging and mobilizing the public, we may see other problems too being even better addressed by this means. Preventing violence – between individuals and between groups – is an example. Similarly, improving nutrition, reducing non-communicable diseases, controlling the spread of dengue, minimizing the transmission of sexually transmitted diseases, enhancing child development, reducing sexual abuse, fostering happier family life and many other goals are better reachable through public action. Issues further afield such as the prevention of corruption and controlling the actions of politicians and law enforcers may too, eventually, be won through public action.

The time will likely come when public health professionals see their role as mainly to awaken, inform and guide people to improve their own wellbeing. I look forward to the day when the professional community accepts as guiding inspiration the tenet, ‘Public health is public property’.

Declaration of the author: Diyanath Samarasinghe holds token shares in the tobacco company to enhance the effectiveness of his tobacco control activities, but does not trade in them or encash the resultant dividends.

References


The hidden facets of hypertension among workers

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Introduction

Hypertension is the leading risk factor for death and disability globally. It is a silent killer and a public health epidemic. Hypertension disproportionately impacts on the low- and middle-income countries predominantly in younger age groups. It is however preventable to a large extent through effective policies implemented to promote healthy behaviour and screening. In this regard, the socio-economic environment of people is well-known to play a significant role in the development of hypertension. Identifying and investing on high-risk population sub-groups that show high returns is therefore pragmatic for reducing the future burden of hypertension. The workplace is an ideal setting for such initiatives, as work-related health problems result in poor productivity and economic loss. On the other, a healthy employee adds money, positivity and productivity to the organization and country. Hence, it is a vital investment, and such investments should be made based on evidence available.

Hypertension and occupation

Hypertension contributes to 7.6 million premature deaths accounting for 13.5% of the global total as well as to 92 million disability-adjusted life years (DALYs) (1-2). As a major risk factor, it contributes to 54% of stroke and 47% of ischaemic heart disease worldwide. The global prevalence of hypertension is expected to rise by 30% during 2000-2025, with 560 million new cases added to the existing burden (3). It disproportionately affects low- and middle-income countries; two-thirds of those with hypertension are in these countries (4). Sri Lanka is not spared, with the prevalence of hypertension steadily rising, causing a significant burden across all socio-demographic sub-groups. A study conducted in 1990-1991 among 975 middle-aged males aged 35-59 years in the Central Province of Sri Lanka reported a prevalence of only 16.9% (5), which had shown to increase in the subsequent decades (6-8), highlighting the need to take immediate measures to prevent the escalating burden of hypertension.

The non-modifiable risk factors of hypertension are age, sex, and genetics, while the modifiable behavioural risk factors include unhealthy dietary habits, high salt content in the diet, alcohol consumption, smoking, sedentary lifestyle, obesity and stress (9). A crucial determinant of these behavioural risk factors is the socio-economic status (SES) of adults, which is indicated by their educational attainment, income and occupational category (10-11). In concurrence, social inequalities are identified as an important determinant of diseases (12), implying that health is determined mostly by one’s living and working conditions. This is highly relevant with regard to hypertension, which acts as the single largest cause of morbidity and mortality in the working population. Depending on the nature of their work and work commitments, the risk factors of hypertension are shown to accrue over time. The classic Whitehall Study involving a cohort 18,000 of male civil servants aged 20-64 years has shown that the social gradient of workers based on their seniority/occupation affects the morbidity and mortality in a wide range of diseases (13).
Although the relationship between sedentary occupation and hypertension is well-established, influence of the social gradient in occupation on the prevalence and associated factors of hypertension is not studied in detail in Sri Lanka. To bridge this knowledge gap, a study was designed to explore the ‘hidden facets of hypertension’ to provide evidence for initiating interventions to improve work conditions that have become challenging in many ways. The study was conducted among sedentary workers aged 30-60 years recruited into two groups: senior officers (SOs) and managerial assistants (MAs) working for more than one year in 23 public administrative offices in the district of Colombo, Sri Lanka. The SO group comprised those employed as administrative secretaries, director general, commissioner, government agent, directors and their assistants, while the MA group comprised those working as clerks, stenographers, typists, bookkeepers, storekeepers and shroff. The study population that was recruited and sampling done are given in Figure 1.

![Flow diagram to illustrate the recruitment of the sample](image)
Prevalence of hypertension

The study revealed that the age- and sex-adjusted prevalence of hypertension was almost equal among SOs (32.9%; 95% CI=27.4, 38.6) and MAs (33.0%; 95% CI=29.6, 36.4) (Table 1) (14).

<table>
<thead>
<tr>
<th>Classification of hypertension</th>
<th>Senior officers (n=272)</th>
<th>Managerial assistants (n=739)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>173 (63.6)</td>
<td>469 (63.5)</td>
</tr>
<tr>
<td>Pre-hypertension</td>
<td>11 (4.0)</td>
<td>53 (7.2)</td>
</tr>
<tr>
<td>Hypertension under control</td>
<td>24 (8.8)</td>
<td>49 (6.6)</td>
</tr>
<tr>
<td>Hypertension - Stage 1</td>
<td>58 (21.3)</td>
<td>147 (19.9)</td>
</tr>
<tr>
<td>Hypertension - Stage 2</td>
<td>4 (1.5)</td>
<td>7 (1.0)</td>
</tr>
<tr>
<td>Isolated systolic hypertension*</td>
<td>2 (0.8)</td>
<td>14 (1.8)</td>
</tr>
<tr>
<td>Total</td>
<td>272 (100.0)</td>
<td>739 (100.0)</td>
</tr>
</tbody>
</table>

* Systolic BP ≥ 140 mmHg and diastolic <90 mmHg

The ‘Rule of Halves’ indicates that 50% of the hypertensive cases are undetected; 50% of those detected are not treated, and 50% of those treated are not controlled (15). In support, 17% and 15% of the SOs and MAs in the study were newly diagnosed; and of those detected, 13% and 15% were on treatment for hypertension; and of those treated, 8.8% and 6.6% were currently on treatment. The findings highlight the undetected, untreated and uncontrolled cases existing among sedentary workers in Sri Lanka, who should be provided with education and screening for hypertension at workplaces.

Risk factors of hypertension

Evidence suggests that hypertension in almost 50% is attributed to an unhealthy diet; 30% to increased salt consumption; 20% to low fruit and vegetable consumption; 20% to physical inactivity; and 30% to obesity (4).

- **Diet and hypertension**

A meta-analysis of cohort studies reports that increased consumption of fruits and vegetables from less than three to more than five servings per day is related to a 17% reduction in the coronary heart disease (CHD) risk factors including hypertension (16-17). This supports the WHO recommendation on five or more servings of fruits and/or vegetables per day for better health (16-17).

In the present study, 52% of the SOs were not consuming a diet in the recommended amount, compared to 39% among the MAs. This imparted a significant risk among MAs (OR=2.8; 95% CI=1.4, 5.5) but not among the SOs. Further, energy intake was significantly higher among hypertensives compared to non-hypertensives among both the SOs (2335.3 versus 2049.7 kcal) and MAs (2398.1 versus 2226.0 kcal). In workplaces, adopting a healthy canteen policy where healthier options are available and affordable would allow employees to make healthy choices.

- **Salt and hypertension**

High dietary sodium intake is a known determinant of hypertension, premature death and disability. Although evidence further suggests obesity and physical inactivity as essential risk factors for the development of hypertension, the evidence for the
effect of salt on blood pressure is stronger than that of any other dietary and behavioural factor (18).

In the developed world, the sources of salt in the diet are 77% from pre-packed, processed and restaurant food, 12% from natural content of food and 11% from salt referred to as ‘conscious’ salt which is added at the table and during cooking (Figure 2). In contrast, countries with developing economies have diverse dietary practices with a significant amount of salt being added during the preparation of meals (19). Also, due to exposure to the globalizing food industry, these communities are exposed to high salt in processed food as well. Therefore, evidence should be further generated to identify the major sources of dietary salt to reduce the salt content of high salt containing food.

Although the recommended daily salt intake for a healthy adult is less than 5 g/ day, a recent study that estimated the global, regional and national sodium intake in adults reported that the global mean intake was equivalent to 10.06 (9.88-10.21) g/ day of salt, which was nearly twice the WHO recommended limit of 5 g/ day. The Asian regions had the highest intakes, in which South East Asia reported a daily salt (NaCl) intake of 12.21 g/ day (21).

In the present study, the mean salt intake among SOs and MAs was 10.84 (SD=4.9) and 11.33 (SD=5.5) g/ day respectively. This evidence confirms the findings of previous studies. After adjusting for confounding factors, a 100 mmol increase in sodium was associated with an average increase of 3.1 (95% CI=2.0, 4.2) mmHg in systolic blood pressure (SBP) and 1.8 (95% CI=0.89, 2.6) mmHg in diastolic blood pressure (DBP) (22). An average 5 mmHg reduction in BP will be achieved for every 6 g/ day reduction in salt. Accordingly, it can be estimated that a population-wide reduction of 6 g/ day will result in a 24% reduction of deaths due to stroke and 18% reduction in deaths from CHD or avoidance of some 2.5 million deaths worldwide every year. A population-wide reduction in SBP of 2 mmHg by preventive measures such as salt reduction has been predicted to lower the stroke mortality by 10% and mortality due to ischaemic heart disease or other vascular cause by approximately 7% in middle-aged populations (23). Therefore, the WHO has recognized salt reduction as one of the ‘best buys,’ as it is one of the most cost-effective and feasible approaches to prevent noncommunicable diseases (NCDs), with the recommendation to reduce dietary salt by 30% (24). This evidence should be utilized for the implementation of initiatives to reduce dietary salt as a measure to reduce premature deaths due to NCDs among the working population.

• Physical inactivity and hypertension

There is compelling evidence that physical inactivity is responsible for a large proportion of NCDs. It is estimated that approximately 9% of premature mortality (5.1%; 12.5%) or more than 5.3 of the 57 million deaths are attributable to physical inactivity (25-26). Occupation related activities represent the greatest portion of the daily time for most workers before retirement.

In the present study, socio-economic variations in relation to physical inactivity were observed (58.1% among SOs and 30.6% among MAs) (Figure 3). Of the diagnosed hypertensives, 44.7% and 49.4% reported low and moderate physical activity levels; and 35.9% and 57.5% among the non-hypertensives. After adjusting for potential confounding factors, being physically inactive imparted a significant risk for hypertension (OR=1.33; 95% CI=1.07, 1.65), indicating that physical inactivity increases the risk of hypertension by 30% (27). Despite the current knowledge of physical activity promoting the health of an individual, the practices among sedentary workers are different. It was shown in the study that employees spend a considerable amount of time traveling to work. Majority travelled over 15 km to work, which is a considerable amount of time of being seated, which could be a contributory factor. It should be noted that reported physical inactivity levels are likely to be an underestimate of the true burden attributable to inactive lifestyles.
• **Overweight/obesity and hypertension**

Mohan et al. (28) reported that overweight and obesity increase the risk of hypertension by 1.72 (95% CI=1.32, 2.26) and 2.37 (95% CI=1.87, 2.99), respectively. It is alarming, since the current evidence suggests that among the overweight and obese subjects, CVD risk is not significantly increased unless hypertension is present (29).

As seen in Figure 4, 19% and 50% of the SOs and 21% and 43% of the MAs were obese or overweight. The already established association between body weight and hypertension was observed in the present study too. Overweight and obesity were significantly associated with hypertension among SOs and MAs (OR=2.02; 95% CI=1.35, 3.02).

Findings suggest that the majority of the study population consumes an unhealthy diet, are physically inactive and obese/overweight. Obesity results from physical inactivity, changing work conditions, eating patterns, portion sizes and the built environment. Hence, appropriate preventive measures should be taken to prevent the impact of the detrimental effects of the above on employee’s health.

• **Stress and hypertension**

Numerous studies have explored whether the increased risk of CVD because of job stress is mediated through hypertension. Specifically, studies of job stress had indicated significant positive associations with work-related hypertension (30). During work hours, systolic BP in men facing job stress is typically 4-8 mmHg higher than those without job stress and suggests that early detection and preventive strategies would reduce job stress (31).

The Whitehall II Study reports a significant effect of job stress measured using Efforts-Rewards-Imbalance (ERI) model on CHD incidence (32). Similarly, job stress assessed using ERI model validated for administrators in Sri Lanka (33) reported that the prevalence of hypertension among employees having ERI ratio was above 75% for SOs and MAs (Figure 5) (14). Among SOs, the job stress as measured by high ERI (OR=2.8; 95% CI=1.1, 7.4), over-commitment (OR=2.5; 95% CI=1.1, 5.6) and high efforts (OR=2.5; 95% CI=1.2, 5.3) increased the risk of hypertension. Among the MAs, the job stress as measured by high efforts (OR=3.02; 95% CI=1.9, 4.8) was significantly associated with hypertension (14).

**Economic impact of hypertension**

Another facet that was looked into was the economic impact due to hypertension. Chronic diseases such as hypertension deprive individuals of their health and productive potential. The burden of chronic diseases may invariably challenge household income and savings and compete with investment activities. The socio-economic burden is two-fold. The direct impact due to the patient having to bear the cost for medication, investigations and lost earnings and the indirect impact to the country via loss of productivity due to days off from work, absenteeism and presenteeism.

Considering the direct household cost for outpatient care (OPD), the total mean cost was highest
for obtaining treatment from consulting a physician among both SOs (Rs.5554.98) and MAs (Rs.5357.21), while it was lowest for consulting a general practitioner among both SOs (Rs.2229.07) and MAs (Rs.2992.08). Of the total OPD cost, the highest mean cost was for investigations at all three different types of consultations. The hospital admission cost to a government institution for treatment of hypertension or a related complication (Rs.12560.00) and investigation (Rs.7741.40) was lower than the cost incurred in the private sector admission (Rs.138785.00) and investigation (Rs.68589.36).

The production loss (GDP) is the loss to the society owing to an employee being sick and loss of income to the family if an employee is removed from the workforce due to death and disability. Productivity related costs are much crucial from an employer’s perspective and also would be helpful in policy debates and decision making. The estimated GDP loss due to sickness absenteeism to the government was Rs.210,513.81 for SOs (n=34) due to their taking 78.5 days off and Rs.194,787.27 for the Mas (n=95) due to taking 268 days off. In estimating the impact on GDP in this study, only the medical and casual leave was taken into account. However, the losses due to presenteeism were not accounted for. Presenteeism is an employee on the job, but because of illness or related complications, does not adequately perform, leading to less productivity. It is reported that presenteeism accounts for a greater portion of productivity loss (34). The estimated economic impact due to lost earnings of a male and female SOs leaving the workforce early at the age of 50 years when the retirement age is 60 years was Rs.6,643,906.73 and Rs.6,989,780.60, respectively, while the economic impact due to lost earnings for a male and female among the MA was Rs.3,013,023.00 and Rs.3,178,862.85 respectively.

The cost of inaction is high. The government will have to bear the brunt of the cost of pension, the cost of an employee replacing this worker, to which will be added the cost of recruiting and training the new worker, and possible productivity losses that will be incurred due to the new worker being less experienced.

Worksite health promotion

The public health sector in Sri Lanka has both the challenge and the opportunity in addressing population-wide hypertension through prevention and control, for which evidence-based programs are mandatory. To assess the current situation, 23 administrative institutions were studied to see if they were health promotive settings. 26% of the SOs and 33.8% MAs identified the workplace as a health promoting work setting. Interestingly, 27.7% and 37% non-hypertensive SOs and MAs were from a health promotive work setting, respectively. After adjusting for confounding effects, health promotive work setting was significantly and negatively associated with hypertension among SOs (OR=0.37; 95% CI=0.17, 0.79) and MAs (OR=0.48; 95% CI=0.28, 0.81) (35). Considering workplace as a health promotional setting is essential to improve the work environment to be conducive to prevent unhealthy behavioural practices.

Most individuals with hypertension are unaware that their BP is high. A large proportion of those who are aware that their BP is high remain untreated and, even when treated, a large proportion still have sub-optimally controlled BP. Effective lifestyle and drug treatments are available that could control hypertension in most individuals. Worksite interventions can include a wide variety of health-promotion activities because employees spend a large portion of their awake hours at work. “Health behaviour and health outcomes are products of their unique environments.” The working environment should support a healthy choice.

The current study showed that the prevalence of hypertension and associated risk factors vary depending on the job category, which acts as a social determinant. This is the attributable risk; the portion of disease rate attributable to the exposure and therefore could be prevented. Once exposed to the risk factor/s however, the magnitude of an exposure and disease remains the same among the categories.

Nudging to be healthy – The way forward

It should be kept in mind that habits that took years to build cannot be changed overnight. It needs sustainable efforts from all concerned. Choice architecture is a solution to change. Choice architecture is a configuration for how the choices are presented and Nudge Theory is about encouraging, or nudging, people to make healthier lifestyle choices without being ‘nannied’ and without losing freedom of choice (36). The choice architecture heavily influences humans. A nudge is a carefully defined choice architecture which
gently pushes people toward a decision that will benefit them while preserving the full choices for people who wish to go their own way. Rather than trying to overtly ‘change’ people’s behaviour, the idea is to subtly direct people down a particular path by altering their environment. The core of the nudge, concept is making healthier options more feasible, accessible, and appealing. Making the choices available is our task. Every setting is a health setting. Worksite health promotion activities should include regular periodic screening and surveillance, provision of healthy opportunities like a healthy diet, physical activity, mental health and wellbeing, and policy commitment. The actions should be continued with inbuilt monitoring and evaluation.

Acknowledgment

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References


Knowledge on primary and secondary prevention of asthma among caregivers of asthmatic children admitted to paediatric wards in Gampaha District

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Abstract

Introduction: Asthma is considered to be one of the major public health problems. The accurate knowledge of caregiver on asthma is important for the management.

Objectives: To describe the knowledge on primary and secondary prevention of asthma among caregivers of asthmatic children admitted to the paediatric wards in the district of Gampaha

Methods: A descriptive cross-sectional study was carried out among 577 caregivers of inward asthmatic children. Pre-tested interviewer- and self-administered questionnaires were used to assess the knowledge on asthma. The grand score of knowledge on asthma was calculated out of 34. The 75th percentile value was considered to differentiate ‘good’ knowledge from ‘poor’ knowledge. Multiple logistic regression was applied to determine the factors associated with poor knowledge on asthma. Results were expressed in adjusted odds ratio (aOR) and 95% confidence interval (CI).

Results: The mean score for knowledge on asthma was 20.6 (SD=4.42) ranging from 7 to 30. Among the caregivers, 369 (64%) had poor knowledge on asthma. Low educational level of the caregiver (aOR=2.48; 95% CI=1.59, 3.86) and being under prophylaxis treatment for less than one year (aOR=2.49; 95% CI=1.50, 4.13) were the determinants of poor knowledge on asthma.

Conclusions: Majority of the caregivers’ knowledge on asthma was poor. The caregivers’ low educational level and shorter duration of prophylaxis treatment for the children were associated with poor knowledge on asthma.

Key words: asthma, children, caregiver, knowledge, paediatrics, prevention
Introduction

Asthma is considered to be one of the major public health problems in the country and Sri Lanka is identified as one of the highest prevalent countries with asthma (1). Disease of the respiratory tract is the second commonest cause for hospital admissions in the country (2). Hospital admission rates have increased from 555 per 100,000 in 1990 to 930 per 100,000 in 2002 (2).

Although asthma cannot be cured, high quality management can control the disease and facilitate children to gain good quality of life. High quality management also includes secondary prevention measures to avoid asthma triggers that irritate and inflame the airways. One of the programme objectives of the World Health Organization for prevention and control of asthma is ‘primary prevention to reduce the level of exposure to common risk factors, particularly tobacco smoke, frequent lower respiratory infections during childhood and air pollution (indoor, outdoor, and occupational exposure)’ (3).

Main predisposing risk factors for developing asthma are the exposure to inhaled substances and genetic susceptibility. Inhaled substances include indoor allergens such as house dust mites in bedding, stuffed toys and carpets, indoor air pollution and pet dander, outdoor allergens especially pollen and moulds, active or passive tobacco smoke, chemical fumes and outdoor air pollution. Also, extreme emotional arousal by means of anger or sorrow, cold air, allergic food and physical exercise, and medications like aspirin and other non-steroid anti-inflammatory drugs trigger asthma (3). The risk factors and triggers may differ among individual children. Therefore, it is important for the caregiver to obtain considerable knowledge to identify the risk factors specific for individual child and avoid them as secondary preventive strategies to control asthma attacks. Also, caregivers have different beliefs on triggering agents, and therefore due to overprotectiveness, they restrict nutritious food items such as milk and eggs from all children with asthma irrespective of the individual triggering agent. Furthermore, it is necessary for the caregiver to be knowledgeable about the importance of continuing prophylactic medication while proper training should be given for handling inhaler devices to control asthma effectively.

Though the associated factors have been identified, the knowledge of caregiver on asthma has not been described in Sri Lanka. Moreover, how knowledgeable the caregiver is in identifying the triggering factors has not been studied in the local context, and therefore a need exists to study caregiver’ knowledge on risk factors of asthma. Findings of such a study will enable the healthcare provider to emphasis on areas where the caregiver’s knowledge has to be improved for betterment of the child. Therefore, the objective of this study was to describe the knowledge on primary and secondary prevention of asthma among caregivers.

Methods

A descriptive cross-sectional study was carried out in paediatric wards in four hospitals namely Colombo North Teaching Hospital Ragama (CNTH), District General Hospital Gampaha (DGHG), District General Hospital Negombo (DGHN) and Base Hospital Wathupitiwala (BHW). The study population was the caregivers with children aged 2-12 years with asthma, admitted to the paediatric wards. The exclusion criteria were caregivers who had not lived in the same household as the child during past six months.

The sample size was calculated assuming the poor knowledge on asthma as 50% and precision as 5%, and the required number was 384 caregivers. The caregivers were selected from the paediatric wards, which were considered as clusters, and therefore a cluster effect of 2.5 was added and the final sample size was 577 caregivers. All the caregivers who were eligible and willing to participate were recruited for the study, from all paediatric wards of the four hospitals from the commencement of the study until the sample size was fulfilled.

An interviewer-administered questionnaire was used to assess the basic demographic data of the caregiver and a self-administered questionnaire to assess the caregiver knowledge on asthma under four components. The four components were general knowledge about asthma, knowledge on risk factors (primary prevention) of asthma, knowledge on secondary prevention (early diagnosis and treatment) and treatment seeking behaviour, and knowledge on disregarding myths with relevance to inhaler drugs. The knowledge questionnaire was constructed based
General knowledge on asthma was assessed by four questions, giving each a single mark. Grand score for knowledge on primary prevention of asthma was scored out of 17 marks for five questions: knowledge on risk factors for childhood asthma to progress in to adulthood (5 marks); knowledge on common risk factors for asthma (5 marks); knowledge on the protective effect of exclusive breast feeding for six months (1 mark); knowledge on common triggering factors for asthma (5 marks); and knowledge on most important area of the house to be free of triggering factors (1 mark). Grand score for knowledge on secondary prevention on asthma was scored out of nine marks for five questions: knowledge on secondary prevention and treatment seeking behaviour of caregiver further included, knowledge on common symptoms of asthma (4 marks), common activities that children can do as normal children when asthma is controlled with medication (2 marks) and knowledge on treatment of asthma (3 marks). The knowledge on disregarding myths about inhaled drugs was scored out of four marks.

The questionnaire was pre-tested among ten caregivers who attended for treatment for their child’s asthma attack at paediatric wards in the CNTH. The reliability was assessed by means of test re-test method. Twenty caregivers were selected from all four hospitals. The self-administered questionnaire was administered to caregivers at two weeks follow-up clinic visit. The selected variables were assessed using Kappa coefficient and results displays the minimum score of 0.68 and good agreement.

Data analysis

Data entry and analysis were done by using Statistical Package for Social Sciences (SPSS) version 16. All data entered was rechecked for accuracy. The mean score for each component of knowledge on asthma was calculated. The mean of the grand score was calculated out of 34. The grand score on knowledge on asthma was converted to percentage values and >75th percentile was considered as ‘good’ knowledge. The bivariate and multivariable logistic regression were performed, and the results were expressed as adjusted odds ratio (aOR) and 95% confidence interval (CI). The Hosmer and Lemeshow test chi-square value of the final model was 0.72 with p value of 0.91, which indicated adequate goodness of fit of the final model.

Results

A total of 149 (25.8%) caregivers were recruited from CNTH, 148 (25.6%) from BHW, 142 (24.6%) from DGHN and 138 (23.9%) from DGHG. The vast majority of the caregivers were mothers of the children (n=513; 92%) followed by grandmothers (n=34; 5.9%) and others (n=12; 2.1%). The majority of caregivers (n=260; 45.1%) had studied up to GCE Ordinary Level (O/L) or had 11 years of schooling. Sixteen (2.8%) had an educational level beyond GCE Advanced Level (A/L) or above 13 years of schooling. Sixteen (2.8%) had studied to GCE Ordinary Level (O/L) or had 11 years of schooling. When considering the total study population of caregivers, 395 (78.5%) had passed GCE O/L.

The highest percentage (89.9%) of caregivers had correctly known that asthma is a disease of the lungs while only 36% had known that asthma is a disease which could be controlled with medication (Table 1). 105 (18.2%) scored four marks, 262 (45.4%) three marks, 190 (32.9%) two marks; and only 20 (3.5%) one mark for general knowledge on asthma.

As much as 85.3% knew that childhood asthma with parental smoking as a risk factor could progress into adulthood, but 71.7% of caregivers had the misconception that consuming excessive amounts of eggs in childhood could also progress to adulthood asthma (Table 1). The knowledge on persisting risk factors was scored out of five marks. Only 24 (4.2%) caregivers scored all five marks, whereas 112 (19.4%) scored four marks; 21 (37.6%) scored three marks; 137 (23.7%) scored two marks; 57 (9.9%) scored one mark; and 30 (5.2%) scored no marks at all.
Most of the caregivers knew that having pets in the house (93.4%) and indoor air pollution (90.3%) are common risk factors for asthma, whereas 67.6% had the erroneous idea that low birth weight was a risk factor (Table 1). 118 (20.5%) scored all five marks; 164 (28.4%) scored four marks; and 214 (37.1%) scored three marks for knowledge on common risk factors for asthma. Only 61 (10.6%) scored two marks; 16 (2.8%) scored one mark; and 4 (0.7%) no score at all.

Assessing knowledge on common triggering factors, 95.5% scored correctly for change in temperature but scored less for emotions (40.2%) (Table 1). About a quarter (27.4%) scored all five marks; 259 (44.9%) scored four marks; 105 (18.2%) scored three marks; 21 (3.6%) scored two marks; and 31 (5.4%) scored one mark; and 3 (0.5%) no marks at all.

Table 1. Distribution of the caregivers’ knowledge on asthma and risk factors (N = 577)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct No.</th>
<th>Correct %</th>
<th>Incorrect No.</th>
<th>Incorrect %</th>
</tr>
</thead>
<tbody>
<tr>
<td>General knowledge on asthma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Asthma is a disease of lungs</td>
<td>519</td>
<td>89.9</td>
<td>58</td>
<td>10.1</td>
</tr>
<tr>
<td>• Childhood asthma will sometimes may continue to adulthood</td>
<td>373</td>
<td>64.6</td>
<td>204</td>
<td>35.4</td>
</tr>
<tr>
<td>• Asthma is a disease which could be controlled with medication</td>
<td>208</td>
<td>36.0</td>
<td>369</td>
<td>64.0</td>
</tr>
<tr>
<td>• Asthma will affect your child’s growth if recurrent attacks occur in frequent intervals</td>
<td>506</td>
<td>87.7</td>
<td>71</td>
<td>12.3</td>
</tr>
<tr>
<td>Risk factors for childhood asthma to progress into adulthood</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Frequent symptoms in first year of life</td>
<td>254</td>
<td>44.0</td>
<td>323</td>
<td>56.0</td>
</tr>
<tr>
<td>• Atopy</td>
<td>227</td>
<td>39.3</td>
<td>350</td>
<td>60.7</td>
</tr>
<tr>
<td>• Maternal history of asthma</td>
<td>414</td>
<td>71.8</td>
<td>163</td>
<td>28.2</td>
</tr>
<tr>
<td>• Consuming excessive amount of eggs in childhood</td>
<td>167</td>
<td>28.9</td>
<td>410</td>
<td>71.1</td>
</tr>
<tr>
<td>• Current parental smoking</td>
<td>492</td>
<td>85.3</td>
<td>85</td>
<td>14.7</td>
</tr>
<tr>
<td>Risk factors for asthma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Low birth weight</td>
<td>187</td>
<td>32.4</td>
<td>390</td>
<td>67.6</td>
</tr>
<tr>
<td>• Indoor air pollution by firewood</td>
<td>486</td>
<td>84.2</td>
<td>91</td>
<td>15.8</td>
</tr>
<tr>
<td>• Smoking within the house</td>
<td>521</td>
<td>90.3</td>
<td>56</td>
<td>9.7</td>
</tr>
<tr>
<td>• Teenage pregnancy</td>
<td>293</td>
<td>50.8</td>
<td>284</td>
<td>49.2</td>
</tr>
<tr>
<td>• Pets in the house</td>
<td>539</td>
<td>93.4</td>
<td>38</td>
<td>6.6</td>
</tr>
<tr>
<td>Common triggering factors for asthma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Viral infection</td>
<td>431</td>
<td>74.7</td>
<td>146</td>
<td>25.3</td>
</tr>
<tr>
<td>• Smoking within the house</td>
<td>510</td>
<td>88.4</td>
<td>67</td>
<td>11.6</td>
</tr>
<tr>
<td>• Emotions</td>
<td>232</td>
<td>40.2</td>
<td>345</td>
<td>59.8</td>
</tr>
<tr>
<td>• Burning mosquito coils</td>
<td>490</td>
<td>84.9</td>
<td>87</td>
<td>15.1</td>
</tr>
<tr>
<td>• Low environment temperature</td>
<td>551</td>
<td>95.5</td>
<td>26</td>
<td>4.5</td>
</tr>
</tbody>
</table>
The majority (94.3%) had knowledge that wheezing noise from the chest was a common symptom. Nevertheless, 58.1% had the erroneous thought that fever was a common symptom of asthma (Table 2). Further, 130 (22.5%) scored four marks; 310 (53.7%) scored three marks while 100 (17.3%) scored two marks; and 37 (6.4%) scored one mark. Over half had the knowledge that bathing (59.3%) and playing or swimming (51.1%) could be done as a normal child when asthma is controlled with medication (Table 2). Therefore, 263 (45.6%) scored two marks; 111 (19.2%) scored one mark; and 203 (35.2%) caregivers scored zero marks. Only 35.4% of the caregivers were able to name a reliever medication correctly; 17.3% to name side effect of reliever drug; and 18% to name an asthma controller drug which is used for longer durations (Table 3). Only 55 (9.5%) answered all three correctly; 81 (14%) scored two marks; 81 (14%) scored one mark; and 62.4% did not get any mark.

Only 52.9% caregivers knew that inhaler drugs need smaller doses compared to oral drugs to relieve symptoms but 61.2% had the misconception that inhaler drugs cause more side effects in the child (Table 2). Four, three, two, one and zero marks were scored by 19.6%, 12.5%, 23.6%, 20.1% and 24.3% for disregarding myths on inhaler drugs.

Out of the overall score on asthma knowledge of 34, mean score for knowledge on asthma was 20.63 (SD=4.42) and ranged from 7 to 30. Only 208 (36%) caregivers had good knowledge on asthma and 369 (64%) had poor knowledge.

### Table 2. Distribution of the caregivers’ knowledge on primary and secondary prevention for asthma (N = 577)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Correct</th>
<th>Incorrect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common symptoms of asthma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Night cough</td>
<td>489</td>
<td>88</td>
</tr>
<tr>
<td>• Cold</td>
<td>412</td>
<td>165</td>
</tr>
<tr>
<td>• Wheezing noise from chest</td>
<td>544</td>
<td>33</td>
</tr>
<tr>
<td>• Fever</td>
<td>242</td>
<td>335</td>
</tr>
<tr>
<td><strong>Activities could be engaged when asthma is controlled</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bathing</td>
<td>342</td>
<td>235</td>
</tr>
<tr>
<td>• Playing or swimming</td>
<td>295</td>
<td>282</td>
</tr>
<tr>
<td><strong>Knowledge on treatment of asthma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Name a drug that could be used as a reliever medication with an episode of asthma</td>
<td>204</td>
<td>373</td>
</tr>
<tr>
<td>• Name a side effect of above drug</td>
<td>100</td>
<td>477</td>
</tr>
<tr>
<td>• Name a drug that could be used to control asthma and need to be taken for a long period</td>
<td>104</td>
<td>473</td>
</tr>
<tr>
<td><strong>Inhaled drugs when compared to oral drugs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Needs a smaller dose to relieve the symptoms</td>
<td>305</td>
<td>272</td>
</tr>
<tr>
<td>• Cause more side effects</td>
<td>224</td>
<td>353</td>
</tr>
<tr>
<td>• Can deliver the drug directly to the lung</td>
<td>385</td>
<td>192</td>
</tr>
<tr>
<td>• Not good for the patient if used for long period</td>
<td>142</td>
<td>453</td>
</tr>
</tbody>
</table>
Of the socio-demographic factors (Table 3), caregivers’ age less than thirty years, education below Ordinary Level and monthly income less than Rs.5000.00 were significantly associated with poor knowledge on asthma. Of the characteristics of asthma (Table 4), only shorter duration of prophylactic treatment was significantly associated with poor knowledge on asthma. In the multivariate analysis (Table 5), shorter duration of prophylactic treatment (aOR=2.49; 95% CI=1.5, 4.13) and education below Ordinary Level (aOR=2.48; 95% CI=1.59, 3.86) remained significant.
Table 4. Association of the caregivers’ knowledge on asthma with selected characteristics of asthma of their children (N = 577)

<table>
<thead>
<tr>
<th>Characteristics of asthma</th>
<th>Knowledge on asthma</th>
<th>Odds Ratio</th>
<th>p value^1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Good</td>
<td>95% CI</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Onset of asthma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤3 years</td>
<td>164</td>
<td>75.6</td>
<td>53</td>
</tr>
<tr>
<td>&gt;3 years</td>
<td>265</td>
<td>73.6</td>
<td>95</td>
</tr>
<tr>
<td>Duration of asthma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤2 years</td>
<td>301</td>
<td>75.3</td>
<td>99</td>
</tr>
<tr>
<td>&gt;2 years</td>
<td>128</td>
<td>72.3</td>
<td>49</td>
</tr>
<tr>
<td>Previous nebulization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>81.0</td>
<td>4</td>
</tr>
<tr>
<td>Yes</td>
<td>412</td>
<td>74.1</td>
<td>144</td>
</tr>
<tr>
<td>Previous hospitalization</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>166</td>
<td>73.5</td>
<td>60</td>
</tr>
<tr>
<td>Yes</td>
<td>263</td>
<td>74.9</td>
<td>88</td>
</tr>
<tr>
<td>Duration of prophylaxis treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤1 year</td>
<td>378</td>
<td>77.0</td>
<td>113</td>
</tr>
<tr>
<td>&gt;1 year</td>
<td>51</td>
<td>59.3</td>
<td>35</td>
</tr>
<tr>
<td>Acute asthma classification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>380</td>
<td>74.4</td>
<td>131</td>
</tr>
<tr>
<td>Severe</td>
<td>49</td>
<td>74.2</td>
<td>17</td>
</tr>
<tr>
<td>Chronic asthma classification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 2</td>
<td>371</td>
<td>74.6</td>
<td>126</td>
</tr>
<tr>
<td>3 and 4</td>
<td>49</td>
<td>69.0</td>
<td>22</td>
</tr>
<tr>
<td>Type of hospital admitted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching</td>
<td>120</td>
<td>80.5</td>
<td>29</td>
</tr>
<tr>
<td>Other hospitals</td>
<td>309</td>
<td>72.2</td>
<td>119</td>
</tr>
</tbody>
</table>

^1p value at 0.05 significance level
Discussion

The mean score for knowledge on asthma was 20.63 (SD=4.42) ranging from 7 to 30. Among the caregivers, only 208 (36%) had good knowledge on asthma. In a study done in Spain (9), the average knowledge score was 18.5 (SD=3.7) out of 31 which is similar to the current study. Yet in another study (10) using the same questionnaire as in the study in Spain (10). The mean scores were observed to be as low as 14.9, 11.25 and 14.5 for teachers, adolescents without asthma and adolescents with asthma, respectively. A study in an emergency department (11) assessing the patients’ knowledge, the items on general facts about asthma, the role of medications and environmental controls/triggers were correctly answered by an average of 75% of the respondents. Identification of common two symptoms of asthma was more than 77.8% in the current study and closely resembled the 75% of a similar finding in a study in USA (11).

In the current study, identification of triggering factors was relatively high related to change of weather (95.5%), smoking in the house (88.4%), burning mosquito coils (84.9%) and viral infection (74.7%) and was lowest for emotions (40.2%). In another study, higher percentage of respondents (95.1%) understood that their smoking could make their children’s asthma worse (11). A similar study found 94.99% of caregivers were aware of common triggers for asthma exacerbation like upper respiratory infection, weather change and allergens (12). A study in India found parents were knowledgeable on respiratory tract infections (87%), winter climate (31.3%), dust (70%) and smoke (63%) as triggering factors for asthma (13). In the study in Lebanon, caregivers identified dust (61%), indoor smoking (51%) and viral infections (17%) as triggering factors for asthma yet these figures were low compared to the other studies (14). In the current study, only 35.4% could name drugs that could be used as a reliever medication with an episode of asthma, in comparison with only 39.2% answered correctly about the medications that are used in an acute attack (11).

Among the caregivers, only 33.4% knew that inhaled drugs have fewer side effects than oral medications and 75.4% thought they are not good for children if taken for a longer duration. A study by Meyer and colleague revealed that 50% thought inhaled steroids are addictive and not be used for long duration (11). Similarly, according to the study in Lebanon, 56% were concerned about side effects of inhalers (14). Furthermore, the study by Bryant (4) found a higher percentage (73.5%) of caregivers denying that asthmatic children become addicted to their medication. The vast majority (82.6%) of caregivers stated that children with frequent asthma symptoms should be given preventive treatment; a closer figure was observed by Rastogi et al, in which 87.4% caregivers stated routine inhaler steroids were helpful to control asthma (12).

After controlling the confounding effects, caregivers educated less than O/Levels and children under prophylaxis treatment for less than one year were admitted to a teaching hospital, duration of prophylaxis treatment ≤ 1 year, caregiver age < 30 years, and caregiver educated < O/Levels were statistically significant predictors of poor caregiver knowledge (Table 5).

### Table 5. Determinants for poor caregiver knowledge on asthma by multiple regression analysis (N = 577)

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>OR</th>
<th>95% CI Lower</th>
<th>95% CI Upper</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted to a teaching hospital</td>
<td>0.38</td>
<td>0.24</td>
<td>1.46</td>
<td>0.91</td>
<td>2.36</td>
<td>0.11</td>
</tr>
<tr>
<td>Caregiver age &lt; 30 years</td>
<td>0.36</td>
<td>0.23</td>
<td>1.43</td>
<td>0.91</td>
<td>2.25</td>
<td>0.12</td>
</tr>
<tr>
<td>Duration of prophylaxis treatment ≤ 1 year</td>
<td>0.91</td>
<td>0.26</td>
<td>2.49</td>
<td>1.50</td>
<td>4.13</td>
<td>0.00</td>
</tr>
<tr>
<td>Caregiver educated &lt; O/Levels</td>
<td>0.91</td>
<td>0.23</td>
<td>2.48</td>
<td>1.59</td>
<td>3.86</td>
<td>0.00</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.13</td>
<td>0.29</td>
<td></td>
<td></td>
<td></td>
<td>0.00</td>
</tr>
</tbody>
</table>

B=beta coefficient; SE=standard error; OR=odds ratio; CI=confidence interval; p= 0.05 significance level
identified as significant determinants for poor knowledge on asthma. In concurrence, caregivers with a higher level of education showed better knowledge about asthma in two studies (11, 15), highlighting that inadequate literacy is a barrier to asthma knowledge and self-care. Similarly, in Nigeria, caregivers with postsecondary education had a significant association with good knowledge on asthma (16). Since education enables to improve reading, listening and remembering the once learned facts, the credibility of the finding is high.

In the current study, the caregivers of children with prophylaxis treatment for less than one year were more likely to have poor knowledge. It could be that children who had long-term prophylaxis treatment were more likely to have severe disease even with controller drugs. Therefore, the caregivers have more experience on medical encounters, and thereby many chances of gaining knowledge on the disease. Contradictory to the current study, respondents with mild, intermittent or persistent asthma had significantly better knowledge than respondents with moderate or severe asthma when severity was classified by night-time symptoms (11).

Most commonly used study setting among the comparative studies were hospital paediatric wards (12-13, 16), except in one study in which the emergency department was used (11). Another common setting was schools (5, 7, 10, 14). Mostly used study instrument type was self-administered questionnaires. Although this is not perfect for a study population with a diverse educational background, in the current study, only 2.1% of the caregivers had education for no more than five years.

The poor knowledge on primary and secondary preventive methods may persuade the severity of asthma which prolong the suffering period as well. Ultimately, this may affect the performance in school as well as increase the household and hospital cost for managing the disease. Further, the knowledge on some individual items of the questionnaire especially on medications was poor where most of the caregivers scored less than 50%. Therefore, provision of health education, especially emphasizing the knowledge which aims to modify the current practices of the caregivers would be more appropriate. The majority of caregivers in the study sample had good educational level. Therefore, the generalisation of the findings to other districts should be done with caution.

Conclusions & Recommendations

In conclusion, 64% of caregivers of asthmatic children had poor knowledge on asthma. The caregivers not being educated up to O/Levels and shorter duration of prophylactic treatment were associated with poor knowledge on asthma. We recommend providing frequent and comprehensive health education on both primary and secondary preventive aspects on asthma to caregivers during the hospital stay and at follow-up visits.

Public Health Implications

There was a knowledge gap on the primary and secondary preventive methods related to asthma among caregivers, especially on medications. Provision of health education emphasizing on the aspects lacking knowledge, which aims to modify the current practices of the caregivers could be more appropriate especially poorly educated caregivers with children on shorter duration of prophylaxis.

Author Declarations

**Competing interests:** The authors declare that they have no competing interests.

**Ethics approval and consent to participate:** Ethics clearance for the study was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya. Administrative clearance for the data collection was obtained from Regional Director of Health Services, Gampaha District.

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**Author contributions:** NP designed the study, coordinated data collection, performed the statistical analysis and helped to draft the manuscript. CA designed the study, performed the statistical analysis, interpreted the data and drafted the first version of the manuscript. Both read and approved the final manuscript.
References


Validation of a newly developed multi-dimensional instrument to assess maternal perceptions of the quality of institutional postnatal care services in Sri Lanka

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Abstract

Introduction: Postnatal period is an important period during which both mother and the newborn adjust to the new environment. High quality services should be provided during this period in order to prevent adverse health outcomes. Patients' perception of the care received by them is considered an important attribute in the assessment and improvement of quality of health care. However, this should be assessed using a valid and reliable instrument.

Objectives: To assess the psychometric properties of a newly developed instrument to assess the mothers’ perception of the quality of institutional postnatal care in Sri Lanka

Methods: The instrument was validated among 200 mothers who had undergone normal vaginal delivery in Colombo North Teaching Hospital and were in the immediate postnatal period. The factor structure of the instrument, its internal consistency and test retest reliability were assessed as main outcomes.

Results: Following exploratory factor analysis, the instrument consisted of 23 items. Three main domains identified were interpersonal care, technical care and information, and ward facilities and cleanliness. The three-factor model identified was able to explain 58.9% of the total variance of the scale. The Cronbach’s alpha value for the total scale was 0.94. The Spearman’s rank correlation coefficient value for the test retest reliability was 0.94.

Conclusions: The instrument developed for assessment of maternal perception of the quality of postnatal care reported satisfactory level of validity and reliability, thus recommended to be used for improving care provision.

Keywords: client-perceived quality, exploratory factor analysis, validation, postnatal care quality, reliability assessment
Introduction

Postnatal period, or the first six weeks following delivery, is important for both mother and the newborn for many reasons including an increased risk of maternal and newborn mortality (1-2). Around three quarters of neonatal and maternal deaths take place in the first week following delivery, with up to half taking place in the first 24 hours (1-2). Therefore, improving the quality of care provided at hospital during this period is vital for reducing morbidity and mortality among them.

Improving the quality of care begins with assessment of the current quality (3). Client-perceived quality of care is increasingly being considered as an important component in this assessment (4-7) and is defined as ‘subjective and dynamic perception of the extent to which expected health care is received’ (8-9). Mother’s perception of the care received immediately after the delivery of baby may influence her health seeking behaviour in the future (10). Consequently, she may decide not to utilise the same service in case of an emergency, if she perceives the care received as sub-optimal. Therefore, assessing mothers’ perception on the hospital care received and improving it accordingly to suit their needs is a timely requirement.

In Sri Lanka, about 94.6% of mothers receive postnatal care through government institutions (11). Regular monitoring of this care through maternal perception is an easy and swift measure to assess its quality, so that healthcare providers could receive valuable feedback to meet mothers’ expectations and to ensure their satisfaction.

Client perceptions are assessed using both qualitative and quantitative methods. Qualitative methods are useful to understand the concepts behind maternal perceptions, whereas quantitative methods are useful to quantify their reactions (12). Though there are many instruments available for this purpose, only a few have undergone validity and reliability assessments (4). Validity and reliability are important attributes of an instrument that will determine the usability of the results of the instrument to make policy decisions. Further, the instruments already validated in the local and international literature on maternal perceptions were not specific to assess postnatal care. An instrument that has been validated in Burkina Faso and Vietnam assesses the maternal care in general (8), while an instrument that has been validated in Sri Lanka assesses the antenatal care (9). Thus, in the absence of a valid and reliable instrument to assess the maternal perception on the quality of institutional post-natal care in Sri Lanka, the authors developed a new instrument to measure this concept. This paper presents its assessment of validity and reliability. Availability of a valid and reliable instrument would enable the health staff to utilize it to improve their performance during this critical period. This information would be valuable to reform the care to make it more patient centred.

Methods

The instrument was developed by the investigators using a stringent process, which included defining the concept, generation of an item pool, determination of the measurement format, selection of items, pre-testing and testing for psychometric properties (13). The developed instrument had 28 items, which was then subjected to assessment of its construct validity via exploratory factor analysis (EFA). Reliability was assessed through test retest reliability and internal consistency assessment.

Data for assessing construct validity were collected in the three obstetric units of Colombo North Teaching Hospital. The study population was mothers who had undergone normal vaginal delivery and delivered live healthy singleton babies in the study setting. Mothers or babies with unstable health conditions at the time of interview, mothers who are unable to converse in Sinhala language and mothers for whom the discharge procedures have not been completed at the time of the interview were excluded.

The sample size was decided based on different recommendations that were found in literature in relation to sample size determination for EFA. Some experts suggest that five to ten participants per item in the instrument is considered adequate, while some have suggested cut-offs based on the total number of participants (14). Based on the former method and as the number of items in the finalized instrument was 28, it was decided to recruit 200 participants for the study. Consecutive sampling technique was used to recruit participants from each ward until the required sample size was collected. Data were collected from 1st November 2016 to 13th December 2016 by three trained female pre-intern medical graduates. Data collection was carried out once all the discharge procedures have been completed for each selected
Data analysis

The data entry and EFA were conducted by the PI using Statistical Package for Social Sciences (SPSS) version 21. Prior to EFA, data were initially screened for the suitability for factor analysis. Reliability of the instrument was ensured by assessing the internal consistency (15). A Cronbach’s alpha score of more than 0.7 was considered as adequate (16). Test retest reliability was assessed by re-assessing 30 participants 2 weeks following the first assessment. A value of 0.7 or greater was considered as satisfactory reliability (17).

Results

All 200 mothers responded to the questionnaire. The mean age of the sample was 28.9 years (SD=4.8). Majority of the mothers were Sinhalese Buddhists and belonged to the 20-34 age group. The basic information of the study population is given in Table 1.

Prior to conducting the EFA, data were screened for their suitability for conducting an EFA. Univariate normality was assessed by computing histograms and standardized skewness and kurtosis for all the items. The acceptable range were taken as -1.96 to +1.96 (18). Except for two items, all the other items had skewness values in the acceptable range.

Factorability was assessed by observing inter-item correlation matrix, anti-image matrix and measures of sampling adequacy. Correlation matrix revealed that five items had a high number of correlations below 0.3. Therefore, they were removed from the item list, one by one. Thus, the final instrument subjected to EFA had 23 items. All the diagonals on the anti-image correlation matrix were above 0.5. Bartlett’s test of sphericity was significant, indicating that the correlation matrix was significantly different from the identity matrix (Chi-squared value= 3547.9; p<0.001). The Kaiser-Meyer-Olkin (KMO) measure, which is an index for comparing the magnitude of the observed correlation matrix to the magnitude of the partial correlation matrix, was 0.917, which was greater than the recommended value for factor analysis (>0.5). All these measures established factorability and sampling adequacy.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>20-34</td>
<td>176</td>
<td>88.0</td>
</tr>
<tr>
<td>≥ 35</td>
<td>20</td>
<td>10.0</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinhala</td>
<td>197</td>
<td>98.5</td>
</tr>
<tr>
<td>Muslim</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buddhist</td>
<td>161</td>
<td>80.5</td>
</tr>
<tr>
<td>Catholic</td>
<td>36</td>
<td>18.0</td>
</tr>
<tr>
<td>Islam</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Highest level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 1-5</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td>Grade 6-11</td>
<td>32</td>
<td>16.0</td>
</tr>
<tr>
<td>Passed GCE (O/L)1</td>
<td>64</td>
<td>32.0</td>
</tr>
<tr>
<td>Passed GCE (AL)2</td>
<td>76</td>
<td>38.0</td>
</tr>
<tr>
<td>Graduate</td>
<td>16</td>
<td>8.0</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>160</td>
<td>80.0</td>
</tr>
<tr>
<td>Skilled manual</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Clerical</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td>Professional</td>
<td>24</td>
<td>12.0</td>
</tr>
<tr>
<td>Monthly income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 30,750</td>
<td>48</td>
<td>24.0</td>
</tr>
<tr>
<td>30,750-40,000</td>
<td>64</td>
<td>32.0</td>
</tr>
<tr>
<td>40,001-50,000</td>
<td>52</td>
<td>26.0</td>
</tr>
<tr>
<td>&gt;50,000</td>
<td>36</td>
<td>18.0</td>
</tr>
<tr>
<td>Parity (Current pregnancy)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td>76</td>
<td>38.0</td>
</tr>
<tr>
<td>P2 – P4</td>
<td>124</td>
<td>62.0</td>
</tr>
</tbody>
</table>

1 General Certificate of Education (Ordinary Level)
2 General Certificate of Education (Advanced Level)
Subsequently, EFA was carried out using principal component analysis with varimax rotation, as this combination gave the best factor structure. The number of factors to be retained was decided based on Eigen values and examining scree plots. Four factors had an Eigen value over one while scree plot analysis suggested a three-factor solution (Figure 1). As the qualitative data analysis during development of the instrument suggested five themes, EFA was run three times, setting the number of factors to be extracted manually, as three, four and five. The one with three factors extracted was selected, as it gave the best factor structure, with all items loading to one of the three factors with a factor coefficient of more than 0.45. This value was considered as the cut-off value for factor loadings (14). There were only a few cross-loading items while each factor had more than three items loaded. These three factors explained 58.9% of the total variance.

Table 2. Final factor loadings of the items assigned to each domain in EFA (N = 200)

<table>
<thead>
<tr>
<th>Factor/Item</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical care and Information</strong></td>
<td></td>
</tr>
<tr>
<td>1. Help given by the health workers to take care of your baby</td>
<td>0.82</td>
</tr>
<tr>
<td>2. Information given on caring for the baby</td>
<td>0.76</td>
</tr>
<tr>
<td>3. Help given by the health workers to take care of yourself</td>
<td>0.74</td>
</tr>
<tr>
<td>4. HCWs’ skills to care for you</td>
<td>0.74</td>
</tr>
<tr>
<td>5. Help given by the health workers for breast feeding</td>
<td>0.71</td>
</tr>
<tr>
<td>6. Adequacy of information given to clarify your issues</td>
<td>0.69</td>
</tr>
<tr>
<td>7. Information given on breast feeding</td>
<td>0.68</td>
</tr>
<tr>
<td>8. Information given on danger signs</td>
<td>0.62</td>
</tr>
<tr>
<td>9. HCWs skills to take care of the baby</td>
<td>0.49</td>
</tr>
<tr>
<td><strong>Interpersonal care</strong></td>
<td></td>
</tr>
<tr>
<td>1. Friendliness shown by the HCWs</td>
<td>0.76</td>
</tr>
<tr>
<td>2. Concern shown for pain relief during the postpartum period</td>
<td>0.76</td>
</tr>
<tr>
<td>3. Promptness of the attention shown to you by the HCWs</td>
<td>0.75</td>
</tr>
<tr>
<td>4. Patience shown towards you by the HCWs</td>
<td>0.68</td>
</tr>
<tr>
<td>5. Willingness to discuss about your concerns</td>
<td>0.65</td>
</tr>
<tr>
<td>6. Way the HCWs treated your family members</td>
<td>0.49</td>
</tr>
<tr>
<td>7. Respect given for privacy</td>
<td>0.46</td>
</tr>
<tr>
<td><strong>Ward facilities and cleanliness</strong></td>
<td></td>
</tr>
<tr>
<td>1. Adequacy of space in the postnatal ward</td>
<td>0.84</td>
</tr>
<tr>
<td>2. Adequacy of facilities in the ward</td>
<td>0.78</td>
</tr>
<tr>
<td>3. Cleanliness of the ward</td>
<td>0.63</td>
</tr>
<tr>
<td>4. Adequacy of labour room beds</td>
<td>0.60</td>
</tr>
<tr>
<td>5. Cleanliness of the toilets and washrooms</td>
<td>0.59</td>
</tr>
<tr>
<td>6. Ability to some rest in the postnatal ward</td>
<td>0.46</td>
</tr>
<tr>
<td>7. Adequacy of the number of healthcare workers</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Factor II named as ‘interpersonal care’ domain had an eigen value of 1.76 and explained 7.66% of the variance. Factor III named as ‘ward facilities and cleanliness’ domain had an eigen value of 1.48 and explained 6.45% of the total variance.

Internal consistency of the instrument was assessed by computing Cronbach’s alpha value for the total scale and its domains. The Cronbach’s alpha values for the total scale and all domains exceeded Nunnally’s criteria of 0.7, establishing internal consistency. The Spearman’s correlation coefficients for all domains and the total score were above 0.7, indicating good test retest reliability (Table 3).

### Table 3. Cronbach’s alpha values and Spearman’s rank correlation coefficient values for each domain of the instrument (N = 200)

<table>
<thead>
<tr>
<th>Domain</th>
<th>Cronbach’s alpha value</th>
<th>Spearman’s rank correlation coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal care</td>
<td>0.88</td>
<td>0.97</td>
</tr>
<tr>
<td>Technical care and Information</td>
<td>0.91</td>
<td>0.87</td>
</tr>
<tr>
<td>Ward facilities and Cleanliness</td>
<td>0.82</td>
<td>0.90</td>
</tr>
<tr>
<td>Total Scale</td>
<td>0.94</td>
<td>0.94</td>
</tr>
</tbody>
</table>

#### Discussion

To the best of the authors’ knowledge, this is the first validated instrument to assess maternal perceptions of the quality of postnatal care provided by institutions in Sri Lanka. The instrument demonstrated an adequate level of validity and reliability, which was enabled by following a stringent process during the development phase, as proposed in literature (17, 19-20). Instruments without adequate psychometric properties will invariably deliver misleading information detrimental for policy planning and decision making (4).

The non-judgmental validity of the current instrument was established by conducting EFA, which serves two purposes. It can be used for selection of items during the development phase of an instrument as well to test its psychometric properties. It is used frequently as a measure of construct validity to assess the relationship between the construct under study and other theoretically related constructs. It is suited for concepts such as client perceived quality, which is of multi-dimensional nature. There are no known validated instruments that assess client perceptions of institutional postnatal care, however, many instruments assessing client perception or satisfaction on other aspects have been validated using similar techniques (8-9).

Three factors were extracted by the current analysis namely, interpersonal care; technical care and information; and ward facilities and cleanliness. There is no consensus on the number of dimensions for client perceptions. Literature provides a variety of dimensions ranging from one to fourteen, with the average number being six. Comparison of the instruments used to assess client perceptions demonstrates that most of them have three to five domains. Considered together, the domains assess the characteristics of healthcare delivery, health institution and health personnel, however the EFA has produced different domains in different studies. This may be attributed to the fact that factor extraction is based on characteristics of the study population and properties of the study design (4).

Most of the studies evaluated had a domain in relation to financial and geographical accessibility (8-9, 21). However, this aspect is not relevant to the current study setting as all hospitals included in the study were situated in places with convenient access, where all routine postnatal services were delivered free of charge. Further, mothers who have already delivered in institutions were included in the study, thus geographical access was not relevant in this study.

The factors extracted in other studies assessing the validity of client perception instruments have shown varying amounts of total variance of items, ranging from 44% (8) to 73% (9). The three factors extracted by EFA in the current study explained 58.9% of the variance; indicating that around 60% of the total variance is attributable to these three factors.

The technical care and information domain has accounted for most of the variance explained by the three factors. This depicts that mothers consider receipt of proper care and adequate information as the
most important component of care, as their primary concern is provision of optimum care for their babies. However, some studies have reported interpersonal care being more important for mothers than this aspect (21).

Ensuring reliability of an instrument provides stability to the instrument. The ward facilities and cleanliness domain obtained a minimum score of 0.82. Cronbach’s alpha value is specific to the study sample used, and therefore cannot be applied to other samples. Yet, there is consistency among studies assessing client perceptions and satisfaction, where domains related physical facilities have obtained lower reliability values than other domains (8-9, 22). This may be attributed to the fact that physical facilities are less inter-related compared to the other dimensions of client perceived quality care.

Test retest reliability assessment for the instrument signified a good temporal stability. Cronin and Taylor (1992) suggests that perceived service quality is an attitude that will persist for a longer period (23), which may explain the high Spearman’s rank correlation coefficient value. It also indicates that mothers’ responses were not significantly affected by courtesy bias as the interviews were conducted as exit interviews at the hospital setting. Accordingly, the developed instrument is suitable to assess client perceptions on institutional postnatal care received following normal vaginal delivery.

A few limitations were identified in this study. As this instrument was specifically developed to measure client perceptions in specialized care institutions in the government sector, it may not be possible to use the same instrument to evaluate the care provided by the primary care institutions or in the private sector. Further, only mothers who have had normal vaginal delivery were included in the instrument development. The experience of mothers who had complicated deliveries may differ significantly from them as the care and monitoring may differ for normal deliveries than mothers who had complicated deliveries (2). Therefore, the instrument may not provide an accurate output if used to assess the perceptions of the quality of care received by mothers with complicated deliveries.

Conclusions & Recommendations

The instrument developed for assessment of the maternal perceptions on the quality of care provided following normal vaginal delivery in hospitals in the government sector reported adequate level of validity and reliability. It can be used for improving care provision.

Public Health Implications

This study established validity and reliability of a newly developed instrument to assess the client perceived quality of institutional postnatal care. The instrument can be used by health institutions to obtain a feedback from post-partum mothers on the quality of the services received, as perceived by them, which is an important component in the assessment of quality of healthcare. This feedback can be used to meet the expectations of mothers and will have direct implications on maternal satisfaction of the services.

Author Declarations

Competing interests: Authors declare that they have no conflicts of interests.

Ethics approval and consent to participate: Ethics clearance for the study was obtained from the Ethics Review Committee, University of Colombo, Sri Lanka (Reference No: EC-15-098)

Funding: None

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Author contributions: SW was the principal investigator and was involved in designing the study, development of the study instrument and conducting the statistical analysis. WG and NH were the supervisors and provided the technical guidance and did the overall supervision. SW drafted the manuscript and WG and NH did proof reading and modified the article.
References


Knowledge and attitudes towards contraceptives among undergraduates in the state universities of Western Province

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Abstract

Introduction: Contraceptives help prevent unplanned pregnancies and have the desired number of children with adequate space. Most undergraduates are living outside their home environment. Despite being more vulnerable to risk behaviour, their knowledge and attitude towards contraceptives are poor.

Objectives: To describe the knowledge and attitudes towards contraceptives among undergraduates in state universities of Western Province

Methods: A descriptive cross-sectional study was conducted among 1575 second- and third-year undergraduates using stratified cluster sampling of the selected universities. A pre-tested self-administered questionnaire collected data on knowledge and attitudes on contraceptives. Based on a scoring system, the level of knowledge and attitudes was assessed. Their associations with selected variables were determined.

Results: Of the 1575 respondents, 926 (58.8%) were females. Over 90% were aware of at least one contraceptive method. More than 50% knew that condoms are protective against HIV/AIDS. The knowledge on contraception was ‘good’ in 28.4%. The knowledge on condom use was good in 21%. In multivariate analysis, the only factor associated with good knowledge on contraceptives was studying in Bioscience stream (adj. OR=9.5; 95% CI=7.0, 12.9), whereas the factors associated with good knowledge on male condoms were: being male (adj. OR=13.2; 95% CI=10.3, 16.9), studying in Bioscience stream (adj. OR=1.8; 95% CI=1.1, 1.9) and secondary education in non-mixed type schools (adj. OR=1.4; 95% CI=1.1, 1.7).

Overall, 30.3% (n=477) and 38.6% (n=608) of the respondents had desirable attitudes towards contraception and male condoms, respectively. In multivariate analysis, factors associated with desirable attitudes on contraception were: being male (adj. OR=1.7; 95% CI=1.4, 2.2), studying in Bioscience stream (adj. OR=1.5; 95% CI=1.1, 2.0) and secondary education in non-mixed type schools (adj. OR=1.3; 95% CI=1.1, 1.7), whereas the only factor associated with desirable attitudes on condom use was being male (adj. OR=3.4; 95% CI=2.8, 4.2).

Conclusions: Knowledge and desirable attitudes towards contraceptives and condoms were relatively low among the undergraduates. Being female and studying in non-Bioscience stream were major determinants.

Keywords: attitudes, condoms, contraception, knowledge, reproductive, undergraduates
Introduction

Contraceptives help prevent unplanned pregnancies and have the desired number of children with adequate spacing while preventing pregnancy related health risk in women and infants. In addition, the male condom helps prevent HIV/AIDS (1).

According to the most recent Demographic and Health Survey, contraceptive use is relatively high among married youth in Sri Lanka (2). One study reported that the extent of awareness on family planning methods ranged from moderate to high (63% to 84%) in different age and marital groups (3). A study conducted in 2007 in Sri Lanka revealed that male undergraduates had better knowledge on contraceptive methods (77.5%) compared to females (18%) (4). Similar results have been observed in research done worldwide (5-6). A study conducted in Nigeria revealed that awareness on emergency contraceptive pills (ECP) among female undergraduates was as low as 50.7% (7). In another study among female undergraduates in Ethiopia, 84.2% had never heard of ECPs, and the effectiveness and safety of the method were known only by 23.1% and 58.7%, respectively (5).

Condoms are the only method of contraception that provide dual protection, i.e. protection from sexually transmitted diseases (STD) and pregnancy. Consistent condom use has been recognized as one of the most successful preventive strategies for HIV infection globally including in Sri Lanka. Condoms are widely available in Sri Lanka in STD clinics, family planning clinics, with public health midwives and in pharmacies island wide (8). Condoms were the most well-known contraceptive method (29%) followed by pills (24%) in Sri Lankan adolescents in 2004 (9). In comparison, one study reported that the knowledge on correct condom usage among adolescents in four African countries was very high (10). Further, a study reported a score of more than 75% for positive attitudes towards contraceptives among the undergraduates in Uganda (5). Unlike knowledge, studies on attitudes towards contraceptive methods are scarce in university students.

Students who perform well at Advanced Level examination are the ones selected to state universities, and the society expects them to give leadership to others in the country upon graduation for creating an economically stable and healthier nation. However, being of young age, they too are at higher risk of exposure to risky sexual behaviours. Exploring their knowledge and attitudes towards contraception would be beneficial in providing services targeting their needs. In the absence of recent data on knowledge and attitude towards contraceptives among Sri Lankan undergraduates, the objective was to describe the knowledge and attitudes towards contraceptive methods among undergraduates in the state universities of Western Province.

Methods

A descriptive cross-sectional study was conducted in all state universities in the Western Province of Sri Lanka, namely the University of Colombo, University of Sri Jayewardenepura, University of Kelaniya and University of Moratuwa. Students are enrolled to these universities according to the Advance Level Z score and comprise 32,200 in number according to the university statistics in 2011 (11). The study population consisted of undergraduates studying in second and third years in the universities. Undergraduates in the first year were excluded due to being less familiar with the new environment, and the fourth- and fifth-year students due to smaller numbers (other than in medical faculties). Undergraduates from foreign countries and undergraduates from the clergy were also excluded due to their different socio-cultural backgrounds and due to the sensitive nature of the selected subject. The calculated sample size was 1575. A multi-stage stratified cluster sampling technique with probability proportionate to the size of each university population was carried out to select a representative sample of undergraduates. The details of the methodology are published elsewhere (12).

A self-administered questionnaire was used for data collection. It included one question on conception and nine questions on contraceptive methods (on awareness and the categorization of six methods as permanent and hormonal methods) to assess the overall knowledge on contraceptives. Knowledge on the use of condoms included five statements. One mark was given for each correct answer and zero marks for incorrect and ‘do not know’ answers. Awareness on where to obtain condoms from was assessed with questions on six instances. One mark was given for each correct place; maximum of two marks were awarded for total awareness. The overall knowledge on condoms was assessed using both parts. Total marks obtained were converted to percentages. If the obtained mark was more than 75%, it was categorized
as ‘good’ knowledge, 50-74% marks as ‘satisfactory’ knowledge, and less than 50% marks as ‘poor’ knowledge.

The attitudes towards contraceptives and condoms were separately assessed with five and eight statements, respectively. One statement contained five responses; strongly agree, agree, neutral, disagree and strongly disagree. Mark allocation was as follows: +1 for a desirable attitude; -1 for an undesirable attitude; and no marks for a neutral attitude. Obtained marks were added for a range of scores from -5 to +5 for contraceptives and from -8 to +8 for condoms. Total calculated marks were converted to percentages. Categorizations were done as follows: ≥ 75% of the total marks considered as desirable attitudes and others as undesirable attitudes. Associations of each category with selected variables were assessed with odds ratio (OR) and 95% confidence interval (CI). Multiple logistic regression was applied to detect association.

Results

Of the 1575 who responded, 926 (58.8%) were females and 1551 (98.5%) were unmarried. Mean age was 23 years while 248 (15.7%) were in the Bioscience degree programme and 1082 (68.7%) residing in university hostel or at a boarding place.

Knowledge on contraception and male condoms

A majority (n=888; 56.4%) of respondents knew that pregnancy could occur even at the first sexual intercourse. Over 90% (n=1470) of the respondents were aware of one or more method of contraception. In terms of awareness on individual methods, the highest percentage (n=1419; 96.6%) was reported for oral contraceptive pills followed by condoms (n=1404; 95.6%). Awareness on safe period, emergency pill and intrauterine device were 68.8% (n=1012), 62.8% (n=922) and 64% (n=948), respectively. Awareness on male sterilization was less (n=824; 56.1%) compared to female sterilization (n=939; 63.9%). Only 29.2% (n=429) were aware of Depo-Provera injections, which was also the least known method. Further, 654 (44.5%) correctly categorized oral contraceptive pill as a hormonal method, whereas it was only 17.2% (n=253) for Depo-Provera. Around 40% (42.2% and 38.3%) identified male and female sterilization as permanent methods, respectively. The awareness was poor (n=417; 28.4%) on emergency contraceptive pills as a hormonal method.

More than 50% of the undergraduates knew that condoms are an effective means of protection against HIV/AIDS and they cannot be reused after washing (Table 1). Most (n=1069; 67.9%) were aware about the places to obtain a condom. Pharmacy was the most commonly (n=1037; 65.8%) known place followed by family planning clinic (n=231; 14.7%).

Table 1. Frequency distribution of accurate responses on given statements on male condoms (N = 1575)

<table>
<thead>
<tr>
<th>Statement</th>
<th>No. of accurate responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condoms are an effective way of protecting against HIV/AIDS.</td>
<td>946 (60.1)</td>
</tr>
<tr>
<td>Condom should be used just before ejaculation.</td>
<td>769 (48.8)</td>
</tr>
<tr>
<td>Condom should be put on to the penis before it erects.</td>
<td>481 (30.5)</td>
</tr>
<tr>
<td>Incorrectly used condoms can be burst in the vagina.</td>
<td>598 (38.0)</td>
</tr>
<tr>
<td>Used condoms can be reused after washing.</td>
<td>878 (55.7)</td>
</tr>
</tbody>
</table>

With regards to knowledge on contraception, 28.4% (n=447), 27.3% and 44.3% had good, satisfactory and poor knowledge, respectively. With regards to knowledge on male condoms, 52.9% (n=833) had poor knowledge, 26.2% had satisfactory knowledge and 21% had good knowledge. Factors associated with good knowledge on contraceptives as well as on male condoms (Table 2) were: being male, studying in Bioscience stream and secondary education in non-mixed type schools. In multivariate analysis, only studying in Bioscience stream remained significant in relation to knowledge on contraceptives, while all three factors remained significant in relation to knowledge on male condoms, after adjusting for confounders.

Attitudes towards contraception and condom use

Of the attitudes on contraception, the one that suggested family planning for all couples scored the
most (n=1406; 89.7%), while the least scored was contraceptives not reducing sexual pleasure (n=233; 14.9%) (Table 3). Of the attitudes towards male condoms, only two statements had scored more than 50% as a desirable attitude and of the remaining, two statements scored less than 20%.

Overall, 30.3% (n=477) and 38.6% (n=608) of the respondents had desirable attitudes towards contraception and male condoms, respectively. Factors associated with desirable attitudes on both aspects (Table 4) were: being male, studying in the Bioscience stream and secondary education in non-mixed type schools. In multivariate analysis, all remained significant for attitudes on contraception and only being male for attitudes on male condoms.

### Table 2. Factors associated with overall knowledge on contraception and male condoms (N = 1575)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Knowledge No. (%)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
<td>Satisfactory(^1)</td>
</tr>
<tr>
<td>Knowledge on contraception:</td>
<td>(n=447)</td>
<td>(n=430)</td>
</tr>
<tr>
<td>Sex(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>200 (31.0)</td>
<td>196 (30.4)</td>
</tr>
<tr>
<td>Female</td>
<td>246 (26.6)</td>
<td>234 (25.3)</td>
</tr>
<tr>
<td>Study Stream(^3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioscience</td>
<td>176 (71.0)</td>
<td>44 (17.7)</td>
</tr>
<tr>
<td>Art</td>
<td>122 (23.6)</td>
<td>145 (28.1)</td>
</tr>
<tr>
<td>Commerce</td>
<td>65 (15.3)</td>
<td>122 (28.8)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>84 (21.7)</td>
<td>119 (30.7)</td>
</tr>
<tr>
<td>School type(^4,5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>82 (31.3)</td>
<td>87 (33.2)</td>
</tr>
<tr>
<td>Girls</td>
<td>102 (29.6)</td>
<td>99 (28.7)</td>
</tr>
<tr>
<td>Mixed</td>
<td>184 (28.5)</td>
<td>158 (24.5)</td>
</tr>
<tr>
<td>Knowledge on male condoms:</td>
<td>(n=330)</td>
<td>(n=412)</td>
</tr>
<tr>
<td>Sex(^2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>266 (41.2)</td>
<td>254 (39.4)</td>
</tr>
<tr>
<td>Female</td>
<td>64 (6.9)</td>
<td>158 (17.1)</td>
</tr>
<tr>
<td>Study Stream(^3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioscience</td>
<td>72 (29.0)</td>
<td>65 (26.2)</td>
</tr>
<tr>
<td>Art</td>
<td>61 (11.18)</td>
<td>113 (21.9)</td>
</tr>
<tr>
<td>Commerce</td>
<td>67 (15.8)</td>
<td>124 (29.2)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>130 (33.6)</td>
<td>110 (28.4)</td>
</tr>
<tr>
<td>School type(^4,5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>131 (50.0)</td>
<td>88 (33.6)</td>
</tr>
<tr>
<td>Girls</td>
<td>23 (6.7)</td>
<td>66 (19.1)</td>
</tr>
<tr>
<td>Mixed</td>
<td>103 (16.0)</td>
<td>163 (25.3)</td>
</tr>
<tr>
<td>Total</td>
<td>330 (21.0)</td>
<td>412 (26.2)</td>
</tr>
</tbody>
</table>

\(^1\) For application of statistics, ‘poor’ and ‘satisfactory’ knowledge categories were amalgamated as ‘less knowledge’; \(^2\) Missing data=4; \(^3\) Amalgamated as binary variables: study stream as Bioscience and non-Bioscience; school type as mixed and non-mixed schools. \(^4\) Missing data=297; \(^5\) Missing data=323
Table 3. Frequency distribution of the attitudes on contraception and condom use (N = 1575)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Desirable</th>
<th>Neutral</th>
<th>Undesirable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes on contraception:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Family planning is a good practice that should be adopted by all the couples</td>
<td>104 (6.6)</td>
<td>57 (3.6)</td>
<td></td>
</tr>
<tr>
<td>2. It is all right to make contraceptive methods available to unmarried</td>
<td>1037 (66.2)</td>
<td>269 (17.2)</td>
<td>261 (16.7)</td>
</tr>
<tr>
<td>3. Contraceptive methods do not lead to sub fertility</td>
<td>451 (28.8)</td>
<td>866 (55.3)</td>
<td>250 (16.0)</td>
</tr>
<tr>
<td>4. Contraceptives do not reduce sexual pleasure</td>
<td>302 (19.3)</td>
<td>1031 (65.8)</td>
<td>233 (14.9)</td>
</tr>
<tr>
<td>5. Irrespective of the religion, using contraceptives is not a sinful activity</td>
<td>240 (15.3)</td>
<td>507 (32.4)</td>
<td>819 (52.3)</td>
</tr>
<tr>
<td><strong>Attitudes on male condoms:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. A girl can suggest to her boyfriend to use a condom</td>
<td>1077 (68.8)</td>
<td>347 (22.2)</td>
<td>142 (9.1)</td>
</tr>
<tr>
<td>2. A boy can suggest to his girlfriend that he uses a condom</td>
<td>1057 (67.5)</td>
<td>370 (23.6)</td>
<td>139 (8.9)</td>
</tr>
<tr>
<td>3. Condoms are suitable for casual relationships</td>
<td>776 (49.6)</td>
<td>536 (34.2)</td>
<td>254 (16.2)</td>
</tr>
<tr>
<td>4. Condoms are suitable for steady, loving relationships</td>
<td>626 (40.0)</td>
<td>567 (36.2)</td>
<td>373 (23.8)</td>
</tr>
<tr>
<td>5. It would not be too embarrassing for someone like me to buy or obtain condoms</td>
<td>685 (43.7)</td>
<td>408 (26.1)</td>
<td>473 (30.2)</td>
</tr>
<tr>
<td>6. If a girl suggested using condoms to her partner, it would not mean that she didn’t trust him</td>
<td>315 (20.1)</td>
<td>450 (28.7)</td>
<td>801 (51.1)</td>
</tr>
<tr>
<td>7. Condoms does not reduce sexual pleasure</td>
<td>291 (18.6)</td>
<td>1054 (67.3)</td>
<td>22 (14.1)</td>
</tr>
<tr>
<td>8. The use of a condom by a male partner in a relationship is not a sign of weakness or lessens their manhood</td>
<td>76 (4.9)</td>
<td>525 (33.5)</td>
<td>964 (61.6)</td>
</tr>
</tbody>
</table>

Table 4. Factors associated with overall attitudes on contraception and male condoms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Attitudes No. (%)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitudes on contraception:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=477)</td>
<td>(n=1089)</td>
<td></td>
</tr>
<tr>
<td>Sex 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>239 (37.3)</td>
<td>401 (62.7)</td>
</tr>
<tr>
<td>Female</td>
<td>236 (25.6)</td>
<td>686 (74.4)</td>
</tr>
<tr>
<td><strong>Study Stream</strong> 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioscience</td>
<td>94 (38.2)</td>
<td>152 (61.8)</td>
</tr>
<tr>
<td>Art</td>
<td>152 (29.5)</td>
<td>364 (70.5)</td>
</tr>
<tr>
<td>Commerce</td>
<td>107 (25.3)</td>
<td>316 (74.7)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>124 (32.5)</td>
<td>257 (67.5)</td>
</tr>
</tbody>
</table>

(Continued)
Our study revealed that only 28.4% had good knowledge on contraception, while studying in Bioscience stream was a significant factor associated with it. Further, only 30.5% displayed desirable attitudes towards contraception, which was significantly associated with being male, studying in Bioscience stream and secondary education in non-mixed type schools.

A Sri Lankan study conducted in 2007 revealed that male undergraduates (77.5%) possessed a good knowledge on contraceptive methods while female undergraduates (18%) displayed a low level of knowledge (4). The present study also revealed that males had better knowledge on contraceptive methods than female undergraduates, but this difference was not significant. Good knowledge on contraceptives was reported by 43% of garment factory workers (13). Undergraduates’ knowledge is assumed to be higher than that of garment factory workers. However, this difference could also be due to the different methods of assessment of knowledge. Garment factory workers may also represent different backgrounds, for example participants may be living together or married, having more learning opportunities on family planning and/or reproductive health related matters in workplace etc.

De Silva (2008) has reported that the extent of awareness on family planning methods range from moderate to high (63% to 84%) in different age groups among adolescents (3). According to the current study, more than 93% of the undergraduates knew at least one method of contraception. Pills were the commonly known method (96.6%) followed by condoms (95.6%). According to the UNICEF National Survey, using condoms was the predominantly known method (29%) followed by pills (24%) (9). Undergraduates’
knowledge on contraception is shown to be better than that of the overall adolescents in the country and the ten-year gap between them may be the cause for this difference.

Almost all undergraduates in a university of Uganda were familiar with some method of contraception though only one fifth knew about female condoms. As in the current study, the most commonly known methods were the oral contraceptive pills and male condoms (6). In another study among undergraduates in Ethiopia, 89.4% were aware of modern contraceptives such as pills (64.8%) and condoms (56.8%) (14). In contrast, one Iranian study reported low knowledge on contraceptive usage among adults (15). In the current study, awareness on emergency contraceptives was 62.8%. One study revealed a lower percentage (43.5%) among female undergraduates from a university in Ethiopia (16). Though the level was 50.7% in female undergraduates in a Nigerian university (7), female undergraduates in Ethiopia had a relatively high awareness (84.2%) (5).

Good knowledge on the use of condoms among undergraduates was only 21%, which was much lower than expected. Males had better knowledge than females. Further, majority (61.2%) of the respondents had an undesirable attitude towards male condoms. In comparison, the knowledge on condom usage has been detected to be relatively high in four African countries (10). Males had higher knowledge than females as in our study. Discrepancy of the results may be due to the assessment of different populations in the two studies. In addition, being in African countries with high prevalence of HIV/AIDS their knowledge may be greater than ours.

Condoms are the only method of contraception that provide protection from STIs and pregnancy. Consistent condom use has been recognized as one of the most successful prevention strategies for STIs prevention including HIV, globally (8). In consistent with the current study, a negative attitude towards condom was reported among young unmarried Indian males (17).

The results of this study are based on a representative sample of four state universities in the Western Province, and therefore the selection bias is minimal. A qualitative study is recommended to assess in-depth knowledge and attitude towards contraceptives and condoms.

Conclusions & Recommendations

Good knowledge and desirable attitudes towards contraceptives and the use of condoms were low. Male Students and those studying Bioscience contributed to good knowledge as well as desirable attitudes towards contraceptives and condoms.

Public Health Implications

As the knowledge and desirable attitude towards contraception including condoms are relatively low, undergraduates comprise a high-risk group for risky sexual behaviour. It should be improved for achieving reproductive health among them and for future generation.

Author Declarations

Competing interests: The authors declare that they have no competing interests.

Ethics approval and consent to participate: Ethical approval was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Kelaniya (P202/12/2013). Informed written consent was obtained from participants.

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Acknowledgements: All the undergraduates who participated in the study and the staff of the universities, data collectors and the members of the Board of Study in Community Medicine, Postgraduate Institution of Medicine.

Author contributions: Both authors have contributed equally to the design the study. UP and CA analysed and interpreted the data. UP was responsible for the conduct of the literature review and implementation of study and a major contributor in writing the manuscript. All authors read and approved the final manuscript.
References


4. Herath HMRP, Dissanayake DMAB, Hilmi MAM, Pathmeswaran A, Wijesinghe PS. Adolescent sexual practices and contraceptive usage. A collection of research papers on adolescent sexual and reproductive health. Faculty of Medicine, University of Kelaniya, 2008; 171-195.


The burden of alcohol use: an update on the local and global picture

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Introduction

Ethanol is popularly referred to as alcohol, although all organic compounds with an -OH segment attached to the alkyl chain are known as alcohols (1). Ethanol is water soluble, because alkyl chain is very short with just two carbon atoms (1). The boiling point of ethanol is 78°C and the density is 0.79 g/ml (1). In this article, the term alcohol refers to ethanol.

Use of alcohol as a psychoactive substance and a cultural and culinary implement has a long history (2). While alcohol has had a significant impact on human civilisation, the chemical alcohol also has various short- and long-term effects on different organs of the body (3). The acute effect on the function of brain is the so-called psychoactive effect.

The primary acute effect of alcohol on brain in the short term is depression of the electrical activity of the brain, hence the name ‘CNS depressant’ (4). Alcohol potentiates the inhibitory effects of gamma-amino butyric acid (GABA) and dampens the excitatory effects of glutamate by antagonising N-methyl-D-aspartate (NMDA) receptors (5). Benzodiazepines are the other CNS depressant group among the well-known psychoactive substances. They also act on GABA receptors, and, understandably, show cross-tolerance (4-5). CNS depressants produce increased reaction time, somnolence, respiratory depression; and they do suppress anxiety and insomnia, but only briefly (4-6). While anaesthetics rapidly depress global brain activity, alcohol first impairs highly integrated functions, such as skilled dextral performance (6).

The pattern of alcohol use (Table 1), usually over 12 months, is recognised as a psychiatric disorder when characterised by certain diagnostic criteria (7). The most severe form of alcohol use

<table>
<thead>
<tr>
<th>Category of alcohol use</th>
<th>Diagnosis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathological alcohol user</td>
<td>Alcohol dependence</td>
<td>More severe form of alcohol use disorder</td>
</tr>
<tr>
<td>Pathological alcohol user</td>
<td>Harmful use of alcohol</td>
<td>Less severe form of alcohol use disorder</td>
</tr>
<tr>
<td>Non-pathological alcohol user</td>
<td>None</td>
<td>User without an alcohol use disorder</td>
</tr>
<tr>
<td>Non-user of alcohol or abstainer</td>
<td>None</td>
<td>User who has not taken alcohol for a considerable period of time (usually 6 to 12 months or lifetime)</td>
</tr>
</tbody>
</table>
disorder is ‘alcohol dependence’, which is characterised by features such as tolerance to alcohol and withdrawal state when blood alcohol level is lowered (7). The less severe one is named ‘harmful use of alcohol’, where the main feature is use of alcohol despite experienced harm usually sans tolerance and withdrawal (7). People who use alcohol but fail to meet diagnostic criteria for dependence and harmful use are ‘non-pathological’ drinkers. Others are ‘abstainers’ or teetotallers. Individuals may shift from one category to another over time.

**Health burden**

Alcohol affects almost all organs of the body through various mechanisms. Some of these effects are visible during or soon after a session of alcohol use (short-term effects), while most are visible following repeated regular use (long-term effects). Some of these effects are summarised in Table 2.

<table>
<thead>
<tr>
<th>Table 2. Effects of alcohol on individual organs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organ</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Short term effects</td>
</tr>
<tr>
<td>Brain</td>
</tr>
<tr>
<td>Pituitary</td>
</tr>
<tr>
<td>Blood vessels</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Long term effects</td>
</tr>
<tr>
<td>Brain</td>
</tr>
<tr>
<td>Liver</td>
</tr>
<tr>
<td>Pancreas</td>
</tr>
<tr>
<td>Lipid metabolism</td>
</tr>
<tr>
<td>Heart</td>
</tr>
<tr>
<td>Blood vessels</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Lung</td>
</tr>
<tr>
<td>Muscle</td>
</tr>
<tr>
<td>Bone</td>
</tr>
<tr>
<td>Immune system</td>
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<td></td>
</tr>
<tr>
<td>Sources: (3, 5, 8-14)</td>
</tr>
</tbody>
</table>
The controversy on the health benefits of alcohol use, especially protective effects against ischaemic heart diseases, has been simmering for many decades while generating much research (15). The so-called J-shaped curve of mortality in alcohol users has been seriously challenged. Increasingly, the evidence base on health effects of alcohol is becoming clearer (15).

The giant high-quality meta-analysis by Wood and colleagues published in ‘The Lancet’ in 2018 on the risk thresholds for alcohol consumption arguably put an end to the above controversy (16). The researchers have studied individual-participant data of nearly 600,000 current drinkers from 83 prospective studies to identify the levels associated with the lowest risk for all-cause mortality and for cardiovascular disease (13). This meta-analysis has found that the relationship between mortality (due to whatever cause) and alcohol consumption is positive and curvilinear, and not a j-shaped curve (Figure 1). It was only the cardiovascular diseases, especially ischaemic heart diseases, that showed a j-shaped curve, which still is not a real benefit, as the mortality did not show such a relationship (13).

The minimum risk of death is found in the group who used 100g of alcohol or less per week, i.e. one to two drinks a day, who were shown to lose six months of future life at 40 years of age due to alcohol consumption (13). The group who used more than 350g of alcohol per week would lose four to five years of future life if they were aged 40 years (13). Despite the inevitability of the alcohol industry and their allies ridiculing these findings as “implausible and impracticable”, public health proponents need to actively and objectively focus on the scientific merit and impact of these important findings (16).

In addition to the health burden to the individual, landscape of which is described above, the magnitude of global health burden due to alcohol use is staggering. The number of disability-adjusted life-years (DALYs) attributed to the total health burden due to alcohol use was 99.2 million (95% uncertainty interval (UI)=88.3, 111.2) in 2016, according to the data compiled by GBD 2016 Alcohol and Drug Use Collaborators (17). This includes, not only the direct health burden due to alcohol use disorders, which was 16.2 million DALYs (95% UI=13.0, 20.0), but DALYs attributable to conditions contributed to by alcohol ranging from communicable and non-communicable diseases to injuries. Injuries carried the highest proportion out of the total health burden due to alcohol, which was 21 million DALYs (95% UI=15.9, 26.3). Health burden attributable to cardiovascular disease related to alcohol use was a close second with 20.8 million DALYs (95% UI=14.9, 27.1), while alcohol related malignancies were

![Figure 1. Associations of usual alcohol consumption with all-cause mortality and the aggregate of cardiovascular disease in current drinkers](Reproduced from The Lancet 2018; 391: 1513-1523)
responsible for 14.8 million DALYs (95% UI=13.5, 16.1) (17). The Global Status Report on Alcohol and Health (GSRAH) published by the World Health Organization (WHO) calculates the total health burden attributable to alcohol use to be even heavier at 132.6 million DALYs (10).

The GSRAH reports that the 15y+ per capital alcohol consumption in 2016 to be 6.4 litres for the world, 4.5 for South-East Asia region and 4.3 for Sri Lanka (10). It also reports that the unrecorded alcohol consumption in Sri Lanka to be 0.4 litres of pure alcohol per capita in 2005, 1.5 in 2010 and 1.6 in 2015 (2, 10). The sudden, almost four-fold, rise within five years between 2005 and 2010 is to be noted. Significant doubt has been expressed over these estimates in the sales and survey data analysis report compiled by Leifman et al titled ‘Trends and Patterns of Alcohol Consumption in Sri Lanka: 1981-2017’ (18). Leifman et al reports unrecorded and recorded alcohol use, respectively, to be 0.09-0.18 litres and 2.4 litres of pure alcohol per capita (15+). They also note that the total recorded consumption in Sri Lanka peaked in 2012 at 2.9 litres and declined since then (18).

Health burden of the world due to alcohol is lesser than that of tobacco. As 2.8 million deaths (95% UI=2.4, 3.3) were attributed to alcohol use in 2016 (17), tobacco was responsible for 6.4 million deaths (95% UI=5.7, 7.0) and 148.6 million (95% UI=134.2, 163.1) DALYs in 2015 (19).

In Sri Lanka deaths due to alcohol related cirrhosis, traffic injuries and malignancies were 4,201 per 100,000 population (15y+) in 2016 (10).

Economic burden

De Silva et al reported in 2010 that in Sri Lanka 43.5% earned less than USD 76 per month while spending more than 40% of their meagre income on alcohol and tobacco (20). Although the current income levels are higher in Sri Lanka, this still highlights the economic burden of alcohol on individual families.

Alcohol is hailed as a boost to economy by the alcohol industry and its allies, including some economists, while the costs are largely, mostly intentionally, ignored. The costs of curative health care (inpatient, outpatient and patient’s out-of-pocket expenditure) for alcohol related diseases including intentional and unintentional injuries to self and others was revealed to be a staggering USD million 388.39 in 2015 through a major study conducted by the National Authority on Tobacco and Alcohol (NATA), the WHO, the Ministry of Health and Nutrition of Sri Lanka and the Sri Lanka Medical Association (21). They reported an even higher non-health care cost of USD million 497.50 due to absenteeism and premature death. According to this study, the total economic cost of alcohol was over USD million 885.89 in Sri Lanka in 2015 (21).

The economic cost of alcohol is shown to be, in the UK, in excess of GBP million 21,000 in 2015 (22), USD million 9,627 in Thailand in 2006 (23), and South African Rand million 245,933-280,687 (approximately USD million 16,000-18,000 based on 2019 exchange rates) in South Africa in 2009 (24).

The author, being a psychiatrist, finds that the burden borne by the alcohol user, his loved ones and others in the community is still not fully captured by the statistics given in this paper. The heartache experienced by the spouse and children of a man who spends hours drinking alcohol with few others at a family wedding, the frustration felt by them as he is not fit to drive them back home, the shame felt by them as he staggers and dances becoming the laughing stock are few examples of the burden that is routinely missed to be captured in numbers. The deterioration in personality of the chronic heavy alcohol user making him unrecognisable to his loved ones and the long-lasting negative impact on the personality development of his children are elusive to measurement, too. Interestingly, the attempt to scientifically study the harm to others from alcohol use has now started (25-26).

The author is a member of an international research team currently studying this in Sri Lanka and in few other countries.

Way forward

The shift in the public attitude towards tobacco from commodity to product harmful to health over the last half century is a critical part of the narrative of the tobacco control in today’s world (27). The health, economic and personal burden of alcohol use is extensive. However, the public, political and academic discourse is not yet ready to accept a paradigm shift in their attitude towards alcohol use similar to what happened in the case of tobacco smoking.
The current attitude towards alcohol is evident in the Global Status Report on Alcohol and Health published by the WHO, which denotes harm due to alcohol use by the dubious term ‘harmful use of alcohol’ (10). This term gives rise to confusion, as it is the same term that is used to denote a type of alcohol use disorder (Table 1) in the ICD-10 Classification of Mental and Behavioural Disorders published by the WHO (7). Furthermore, ‘harmful use of alcohol’ does not effectively capture harm due to ‘non-pathological alcohol use’ such as traffic injury following alcohol use in persons who do not have pathological drinking.

A prerequisite to traverse the road towards a future world that perceives the role of alcohol and alcohol industry in public health the way it perceives the role of tobacco and tobacco industry today, is to induce a progressive alteration in the public, political and academic discourse. The author has already pointed out the need of a revision of taxonomy in alcohol, and suggested two new terms, ‘value’ given to alcohol and ‘promotion’ of alcohol use (28). The letter calls on doctors to be vigilant at all times to detect how they become, intentionally or unintentionally, involved in promotion of alcohol and its use (28).

Perhaps, the time is right to call for a shift in our attitude towards alcohol; towards a more progressive and scientific one – not towards a prohibitionist one. Such a futuristic attitude would make us consistently and assertively question the ‘value’ given to alcohol and the ways it is ‘promoted’ across social, academic and other platforms. With the publication of the findings of Wood et al, it is now confirmed that even small amounts of alcohol are harmful to individual health. Furthermore, evidence of harm to others from alcohol use in the primary user is being synthesised currently. In this context, alcohol use and alcohol industry start to look increasingly similar to tobacco smoking and tobacco industry. The need of an international Framework Convention for Alcohol Control (FCAC), similar to the WHO’s Framework Convention on Tobacco Control (FCTC) has been highlighted (29). It may not be essentially unwise to assume that the call for the attitude shift has already begun.

Declaration of the author: Mahesh Rajasuriya is a member of the Expert Committee on Tobacco, Alcohol and Illicit Drugs of the Sri Lanka Medical Association, the founding director of the Centre for Combating Tobacco at the Faculty of Medicine, University of Colombo, and the Chairman of the Alcohol and Drug Information Centre (ADIC) Sri Lanka.

References


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Manuscripts should be prepared using the specifications given below:

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- Paper margins: Left hand - 1.5”; right hand, top and bottom - 1”.
- Font style: Calibri
- Font size: 11 point
- Spacing: double

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- Abstract
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- Methods
- Results
- Discussion
- Conclusions and Recommendations
- References
- Author Declarations
- Funding
- Acknowledgement
- Clinical trial registration number
- Clinical trial registration number
- Ethical approval
- Clinical trial registration number
- Clinical trial registration number
- Clinical trial registration number
- Clinical trial registration number

**Abstract**

The abstract should not exceed 300 words.

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This section should explain the background of the study, based on existing literature on the current status of the problem, gaps in current knowledge, and why this study was necessary or its contribution to the field. Objectives should be clearly stated at the end of the introduction.

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This section should include: Design and setting of the study; Characteristics of the study participants (inclusion and exclusion criteria) or description of the material used; Sample size calculation giving the relevant assumptions, including a power calculation if appropriate; Details of the sampling method used; A clear description of the study instruments and wherever relevant, validity of the instruments used and definitions of the variables; Data collection procedure used (in trials, all processes and interventions, and outcomes assessed); and Brief summary of the statistical analysis including the statistical tests used.

**Results**

This section should summarise the salient findings of the study, including the statistical interpretation of the findings. All values (variable values, percentages, p value and other statistical figures) should be limited to two decimal points.

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This section should compare the findings with previous research studies, discuss the implications of the findings in the context of existing knowledge and highlight the strengths and limitations of the study.

**Conclusions and Recommendations**

This section should state clearly the main conclusions and provide an explanation of the importance and relevance of the study reported.

**Public health implications of the study (placed within a text box)**

This section should provide a short description in point-form regarding the public health implications of the research findings or the subject/s discussed. The word limit is 75 words.

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