Original Article

Unmet need for family planning among married women of reproductive age group in urban Tamil Nadu

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ABSTRACT

Context: Unmet need for family planning (FP), which refers to the condition in which there is the desire to avoid or post-pone child bearing, without the use of any means of contraception, has been a core concept in the field of international population for more than three decades. **Objectives:** The very objective of this study is to determine the prevalence of "unmet need for FP" and its socio-demographic determinants among married reproductive age group women in Chidambaram. **Materials and Methods:** The study was a community-based cross-sectional study of married women of the reproductive age group, between 15 and 49 years. The sample size required was 700. The cluster sampling method was adopted. Unmarried, separated, divorced and widows were excluded. **Results:** The prevalence of unmet need for FP was 39%, with spacing as 12% and limiting as 27%. The major reason for unmet need for FP among the married group was 18%, for low perceived risk of pregnancy, 9%, feared the side effects of contraception 5% lacked information on contraceptives, 4% had husbands who opposed it and 3% gave medical reasons. Higher education, late marriage, more than the desired family size, poor knowledge of FP, poor informed choice in FP and poor male participation were found to be associated with high unmet need for FP. **Conclusion:** Unmet need for younger women was spacing of births, whereas for older women, it was a limitation of births. Efforts should be made to identify the issues in a case by case approach. Male participation in reproductive issues should be addressed.

Key words: Family planning, informed choice, male participation, unmet need

INTRODUCTION

Millions of women worldwide would prefer to avoid becoming pregnant either right away or never get pregnant, but are not using any contraception. These women are said to have an "unmet need" for family planning (FP). The concept of unmet need points to the gap between some women's reproductive intentions and their contraceptive behavior.[1] Unmet need can be a powerful concept for FP programs because it is based on the women's own statement in answer to survey questions, and it identifies the group most likely to be interested in contraception, but who do not use it. The challenge is for FP to reach and serve these women. The concept of "unmet need" points to the gap between some women's reproductive intension and their contraceptive behavior.[2] According to National Family Health Survey (NFHS-3) Survey 2005-2006 unmet need for FP was 13% for India and 8.9% for Tamil Nadu.[3]

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More married women with unmet need live in India than in any other country – approximately 31 million. While FP needs of the majority of women (86%) who wish to stop childbearing are being satisfied, the needs of women who wish to delay or space childbearing remain largely unsatisfied, (only 30% of these women have their needs met). For this reason, young women are more likely to report an unmet need for contraception. The desire to limit family size and to space births are the main reasons given by the majority of those who seek an abortion, which highlights the huge unmet need for contraception for women in India.

According to the NFHS (2005-2006), nearly 21% of pregnancies are either unwanted or mistimed. The NFHS-3 survey (2005-2006) indicated that the unmet need for FP in India was 13% with 6.2% for spacing and 6.6% for limiting.[3]

Using multi-stage cluster sampling the unmet need for FP in different social and demographic groups in selected districts in Tamil Nadu, namely, Madurai, Kamarajar, Pudukkottai, Thanjavur and Nagapattinam was estimated by Ramanujam *et al.* (2005). The percentage of unmet need for FP ranged from 50% in Madurai to 63% in Nagapattinam. It was 56% in Kamarajar and Thanjavur, 61% in Pudukottai and 57% in all the five districts combined. The unmet need for spacing was 1.6 times more than that of limiting births.[4] NFHS-3 report (2006) showed that the rural women had a higher unmet need than urban women for spacing and limiting.[3]

According to NFHS-3 Survey 2005-2006, the unmet need for FP was 13% for India and 8.9% for Tamil Nadu.[3] The use of spacing methods has remained low over the years. In 1990s, the use of contraceptives had declined even in the demographically advanced states like Tamil Nadu. The unmet need of FP was 8.8% for urban areas and 9.1% in the rural areas of Tamil Nadu. The prevalence of contraceptive use in Tamil Nadu is 61%.[3] A community-based study done among married women in a rural settlement in Aurangabad (2001) showed that the prevalence of unmet need was 20%.The main reasons for this were low perceived risk of pregnancy (32.5%), lactation (31%) and ignorance (12%).[5]

Not many available published community based studies have assessed the unmet need of FP in the urban areas of Chidambaram, Cuddalore District. It is against this background that the present study was conducted with the objective of determining the prevalence of unmet need for FP and its socio-demographic determinants among married women of reproductive age in Chidambaram.

MATERIALS AND METHODS

The study was conducted in the urban areas of Chidambaram, Cuddalore district, Tamil Nadu. According to the 2001 census, the population of Chidambaram is 56,946, consisting of 33 wards with approximately 11,390 households. Married women of reproductive age from 15 to 49 years residing in the 33 wards of Chidambaram were taken as the study group. The study was done from December 2008 to June 2009. It was a community-based cross-sectional study.

Data collection

This was done using a pre-tested structured questionnaire which included the following information:

- Socio-demographic characteristics like age, education, occupation, family income, age at marriage and first birth, family size, whether the woman approved of FP
- Assessment of unmet need and reasons for it whether pregnant or not, whether currently using any contraceptive or not, and the reasons for this
- Assessment of contraceptive knowledge: By asking to name any temporary and/permanent methods of contraception, side effects of contraceptive devices
- Informed choice in FP where and how the women get information on FP, whether they know about the cafeteria approach in FP
- Assessment of male participation in FP. Whether the women discuss FP with their husbands, whether he helps her to choose FP method, whether he has used or opposes the use of FP methods

Sampling method

The sample size calculated using the formula $4pq/l^2$ was found to be 700.

Cluster sampling method was adopted. Among the 33 wards, 30 wards were selected. From each cluster, 24 women of reproductive age group were selected.

Cluster identification was done as follows:
The cumulative population of the wards was found out. This was divided by the number of clusters (33) which gave the sampling interval 56,946/33 = 1745. A number was randomly selected from the random number table numerically less than the sampling interval. This was taken as the starting point to which the sampling interval was successively added till 30 clusters were identified, corresponding to the cumulative population of the respective wards. The first house in a cluster was randomly selected. Starting with this household, a house-to-house survey was done till 24 married women in the reproductive age group were identified. The following information was collected by the interview method-age, religion, educational and occupational status, per capita income, age at marriage, age at first delivery, contraceptive knowledge and use, informed choice in FP, any opposition to contraceptive use, and male participation in FP.

Inclusion criteria

The inclusion criteria were women in the reproductive age group of 15-49 age group who were currently married. (Women who were married, who were not using any method of contraception, but who either did not want any more children or wanted to wait for 2 or more-years-before having another child.)

Exclusion criteria

The exclusion criteria were unmarried women, separated/divorced women, widows, pregnant due to contraceptive failure.

Data analysis

Prevalence of unmet need assessed by proportions and determinants of unmet need were analyzed by Chi-square test using SYSTAT package.

RESULTS

Of the 700 married women, 276 had an unmet need for FP. The prevalence was 39% in the study area of Chidambaram [Table 1]. In the study population, the majority were in the age group of 25-29 years which constituted 24.2% of the study population. The educational background of the women showed that 6% were illiterate, 29% had primary education, 42% had middle school education and 4% had degrees/postgraduate degrees. The unmet need for spacing was found to be 12 and 27% for limiting of births [Table 2].

Among the determinants of unmet need for FP, age group, education, occupation of the husbands of respondents, age at marriage, age at first child birth, number of children, desired family size, contraceptive knowledge, opposition to the use of contraceptive methods and male participation in FP had a significant association as shown in Table 3. Unmet need was highest (29%) among those aged between 25 and 29 years, It was seen that unmet need decreased as age advanced ($P = 0.0000$). There was a significant association between husband's occupation and unmet need for FP. Out of those <20 years, 31% had unmet need for FP and 30% had no unmet need. Of the 52% of the women who were married by the age of 20-24 years, 49% had unmet need for FP. There was a significant association between age at marriage and unmet need. As age at marriage rose unmet need decreased (>35 years). 61% of those who had an unmet need for FP knew about only one method of FP, 20% knew about two methods, 6% had knowledge of three methods and 13% were not aware of any methods. Those who had better contraceptive knowledge were found to have fewer unmet needs. Statistically, there was a significant association between opposition to the use of contraception and unmet need. Of the respondents who were opposed to the use of contraceptive methods, 13.2% had unmet need. The major reason for this among the married group was low perceived risk of pregnancy (18%), 9% were afraid of the side effects of contraception, 5% lacked information on contraceptives, 4% had opposition from husbands and 3% gave medical reasons [Table 4].

Table 1: Prevalence of unmet need of family planning

Unmet need	Number	Percentage
Yes	276	39
No	424	61
Total	700	100

Table 2: Distribution of type of unmet need for family planning among study population

Type of unmet need	Number	Percentage
Spacing	82	12
Limiting	194	27
Total	276	39

Table 3: Determinants of unmet need for family planning

Variables	Unmet need		*P* value
	Yes	No	
Age group			
<25	37 (13)	39 (8)	0.005
26-35	145 (53)	178 (42)	
>35	94 (33)	207 (49)	
Education			
Illiterate	14 (5)	33 (8)	
<Class 12	247 (89)	377 (89)	0.001
>Class 12	15 (6)	15 (6)	
Occupation of Husbands			<0.001
Unskilled	62 (23)	113 (26)	
Skilled	156 (25)	266 (63)	
Professionals	58 (21)	45 (11)	
Age at first child birth			
20-24	205 (14)	319 (75)	<0.001
25-29	59 (22)	69 (16)	
30-39	12 (4)	10 (3)	
No. of children			
<2	242 (87)	280 (66)	<0.0001
>2	34 (13)	118 (28)	
Desired family size			
<2	255 (91)	357 (84)	<0.001
>2	15 (6)	54 (13)	
Contraceptive knowledge			
Poor	168 (61)	210 (50)	0.005
Good	108 (39)	143 (33)	
Opposition to use contraceptive methods			
Yes	38 (13)	8 (3)	<0.001
No	236 (58)	394 (93)	
Male participation in family planning			
Poor	234 (85)	284 (79)	0.001
Good	42 (15)	90 (21)	

DISCUSSION

A cross-sectional study on the prevalence of unmet need for FP of married women of reproductive age group was conducted in the urban area of Chidambaram. The study also aimed at finding out the determinants of unmet need for FP in the study population. Of the 700 married women interviewed, 276 (39%) had an unmet need for FP

Table 4: Reasons for unmet need of family planning

Reasons	No. (%)
Lack of information	14 (5)
Fears of side effects	25 (9)
Opposition from family	11 (4)
Little perceived risk of pregnancy	50 (18)
Medical reasons	7 (3)

12% for spacing and 27% for limiting. The District Level Household surveys (DLHS) carried out in Tamil Nadu in 2008 showed an unmet need of 19.4% for spacing and 12.9% for limiting.[4] The NFHS-3 survey for unmet need was 13% for India and 8.9% for Tamil Nadu. There is a clear relationship between women's age and the level of unmet need. Most unmet need of younger women is for spacing births, whereas for older women it is for limiting births. Unmet need typically peaks for many women in their thirties and then declines in the forties.

The study showed that 24.2% was in the 25-29 age groups, where unmet need was at its highest (29%). The unmet need was found to increase with higher educational status. These findings are in accordance with those of various other studies conducted elsewhere.[5-8] The majority of women belonged to the nuclear family, i.e., 72%, and 28% were from joint families. In this study, 424 (61%) of the 700 women interviewed had no unmet need for FP. 53% had undergone permanent sterilization and 3% were using intauterine devices (IUDs). None of them took oral pills. It was found that those who had a better knowledge of FP methods had less unmet need.

According to NFHS-3 (2006) two-thirds of the women currently married have used a FP method at some point in their lives.[3] National average percentage of women using any methods of contraception is 48%. The DLHS for Tamil Nadu (2008) reported similar findings of 53% for permanent sterilization and 3% users of IUDs. The major reason for not using any FP methods was low perceived risk of pregnancy (18%). Spinell noted that when a woman believes that she is unlikely to become pregnant, she may not be interested in contraception.[9] The other reasons in this study were the fear of the side effects of contraceptive methods (9%), lack of information (5%), opposition from husbands (4%) and medical reasons (3%). Ghosh *et al*. in Kolkotta observed that 25% of women did not accept contraceptive methods because of concerns about health and side effects.[8] For 69% of the women, the source of informed choice was the health care worker. A family member/neighbor was the source for 26% and mass media for 3%. According to 53% of respondents, detailed information on FP methods was provided by doctors. Eighty four percent of the women had discussed FP methods with their husbands. Male participation in shared responsibility and counseling was very poor. Only 3% of the men used condoms. Ninety-six percent had nothing against their wives' use of contraception. De Graft and De Silva in a Sri Lankan study (1997) reported that men and women who discussed FP were more likely to use contraception effectively and have fewer children than those who did not.[10] The critical role of the husband has been noted in several studies by Santhya *et al*. (2001),[11] and Jejeebhoy (2003) on decision-making relating to the use of contraception, especially during the early years of marriage.[12] A Reproductive Health Survey in Uttar Pradesh (1997) showed that 87% of women with unmet need said that the decision to use contraception ultimately rests with the husband. Seventy-five percent of men with secondary or higher education approved of FP.[13]

Limitations of the study

- In spite of the best efforts to get the correct age by cross checking, women older than 49 years might have been included in the 45-49 age group, thereby increasing the proportion of women with unmet need particularly for limiting births
- Operational definition of unmet need has its own ambiguity. Especially those who are not sexually active beyond 35-40 years and are relatively not fecund would influence the unmet need towards the higher side. In fact, for them, there is no need for FP, especially in the Indian context.

CONCLUSION AND RECOMMENDATIONS

Over the last two decades, there has been a growing interest in estimating women's unmet need for contraceptive services. While the FP needs of the majority of women (86%) who wish to stop childbearing are being satisfied, the needs of women who wish to delay or space childbearing remain largely unsatisfied (only 30% of these women have their needs met).

The present study has revealed a high prevalence of unmet need for FP for which the following recommendations are suggested:

- One of the key findings in the study was the poor support for spacing methods (3% for IUDs). Efforts should be made to identify the issues in a case by case approach so that the Health care provider can tailor the spacing method to each case as appropriate
- Couples should be given FP counseling together. Inter-spousal communication and joint decision making should be encouraged. The deficiency in this area was observed in this study

- Various aspects of men's participation as reported in this study was very poor. It is recommended that men's participation in decision making on FP and care about reproductive health should be encouraged. There should be programs to address young men's reproductive issues through adolescent care clinics

In the present study, the source of informed choice was attributed to the mass media by 3% of women only. More emphasis should be given to the dissemination of reproductive and contraceptive information through the mass media in order to get a wider circulation.

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A Study of the Health and Nutritional Status of Anganwadi Adolescent Girls in the Field Practice Area of Urban Health Centre Jonakapuram, Travancore Medical College, Kollam

KEYWORDS: Adolescent girls, Nutritional status, malnutrition, Anganwadi

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ABSTRACT ***Background***:- *Adolescence is a significant period for physical growth and development It is closely linked to the diet received during childhood and adolescence. The aim of the study was to assess the health and nutritional status as well as the proportion of malnutrition among adolescent girls and the associated risk factors.*

METHODOLOGY *: Community based cross sectional study which was done among fifty four adolescent girls in the field practice area of Jonakapuram. Majority of the adolescent girls belonged to early adolescence (40.7%) . 11.1% had past history of respiratory infections .Pallor suggestive of anemia was found in 33.3% of the study group . 2% had pedal edema suggestive of protein energy malnutrition. BMI assessment showed more than half (55.55%) were underweight .Recommendations after the problem analysis was that Anganwadi workers should be educated about adolescent health issues and their proper management . There should be classes about adolescent health problems in each anganwadis providing the adolescent girls with maximum benefits possible.*

INTRODUCTION

Adolescence is a period of growth which ranges from 10 to 19 years of age. The term adolescence is derived from the Latin word 'adolescere'; meaning "to grow, to mature". [1] It involves rapid physical growth and significant emotional, psychological & spiritual changes. Within all these perspectives adolescence is viewed as a transitional period between childhood and adulthood whose cultural purpose is the preparation of children for adult roles.[2] It is also a period of greatly enhanced awareness and attention to physical status and well-being. Adolescents constituted 22.8% population of India as on 1st March 2009.[3] About a quarter of India's population comprises of girls below20 years. [4] Within the adolescent age group, proportion of 10-14 year age is greater than that of 15-19 year group. This has important implications for programming & demography as the needs of two subgroups are different.

The problems of adolescents are multi-dimensional in nature & require a holistic approach. A relevant response to their needs-equipping the adolescents with the knowledge ,skills, values & providing them with support, appropriate role models & opportunities can set the stage for their healthy development & growth towards responsible adulthood.

This community based study was chosen as it makes more sense to find out the current issues of physical and mental health among adolescents of the selected regions of community.

Investing resources in adolescents is a sound economic, socio-political and public health strategy and is cost effective in the long-run.

METHODOLOGY: A community based cross-sectional descriptive study was carried out to find out the health and nutritional status of adolescent girls residing in field practice area of UHTC Jonakapuram, attached to Travancore Medical College, Kollam.

Data was collected from seven selected anganwadis in the field practice area which was carried out from 01.03.12 to 30.04.12.

The study was focused solely on the health problems among adolescent girls and 54 girls between 10-19 years old were identified from 7 anganwadis of Johnakapuram coastal area which belongs to Kollam district in which our medical college hospital is situated

The survey was conducted with a pre-tested questionnaire consisting of the relevant physical and mental health questions . Anganwadis were chosen for sample selection with the intention to assess the health education levels, nutritional status and extra activities performed by anganwadis for improving the health status of adolescent girls of the selected regions.

RESULTS

Among the 54 adolescent girls who participated in the study 41% were in the early adolescent group.57% belonged to joint families and 59% werebelow poverty line. The study showed that33% of the girls were anemic. Other health parameter assessments were not significant except that 31% gave a history of allergy.

Nutritional status was assessed using BMI which showed that 56% were under-nourished and 2% obese or overweight. At least 48% of them consumed junk foods. Life style pattern showed that more than half (52%) were engaged in exercises in the form of either outdoor or indoor games.

Mental health profile showed that 37 % had conflicts with their family and 24% had episodes of depression

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Table1:Body Mass Indesx of Adolescent Girls

BMI	Frequency	Percentage
<18.5	30	56
18.5- 24.5	23	43
>24.5	1	01
Total	54	100

DISCUSSION

The study to assess the health and nutritional status of adolescent girls attending the Anganwadis of an urban area of Kollam showed that 41% were in their early adolescence. Among the girls 33% were found to be anemic. A study was done on the anaemia prophylaxis in adolescent school girls by weekly or daily iron folate supplementation by Mohan Joshi et al among adolescent girls among whom 37% were anemic.[5] Prevalence of anemia was 90% in those girls residing in the urban slums of Nagpur[6] and in the urban slums of Lucknow it was 67%..[7] Nutritional status was assessed using BMI which showed that 56% were under-nourished and 2% were obese or overweight.

Wi-Young et al in a study on the prevalence of obesity in Korean adolescent girls showed that 8.7% were obese.[8] A cross-sectional study on the prevalence of malnutrition among adolescent school girls in Kochi showed 7.5% obesity.[9] In this study at least 48% of the girls consumed junk foods. A study on lifestyle associated risk factors in adolescents was done by Singh A K, Maheshwari A, Sharma N, Anand K.[10] which showed that 30% of them consumed fast food 3-4 times a week. Life style pattern showed that more than half (52%) were engaged in exercises in the form of outdoor / indoor games. Indian Journal of Pediatrics study was conducted to evaluate the prevalence of lifestyle-associated risk factors for non -communicable diseases in apparently healthy school children in an urban school of Delhi using standard criteria.[11] Mental health profile showed that 37% had conflicts with their family and 24% had episodes of depression.A study done by Nair et al to find out the prevalence of depression among adolescents showed that 11.2% had extreme grades of depression.[12]

CONCLUSION

The problems of adolescents are multi-dimensional in nature & require a holistic approach. A relevant response to their needs-equipping the adolescents with the knowledge, skills, values & providing them with support, appropriate role models & opportunities can set the stage for their healthy development & growth towards responsible adulthood..

Investing in adolescents makes sense as they are not only in large numbers but also are the citizens and workers of tomorrow who are going to take the country to its prosperous future. Investing resources in adolescents is a sound economic, socio-political and public health strategy and is cost effective in the long-run. This so called 'burden of population needs to be engineered into a 'basket of resources'.

The adolescent psychological changes also deserve attention, including the development of identity distinct from parents and developing own self worth, exploration of new relationships with their peer groups, opposite sex, families and community is a hallmark of adolescence.

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Original Research Article

A Study on the Infant and Young Child Feeding Practices among Mothers in a Selected Rural Area of Kollam, Kerala

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ABSTRACT

Background: Suboptimal breastfeeding accounts for death of 1.4 million children every year. Of all proven preventive health and nutrition interventions, IYCF (infant and young child feeding practices) has the single greatest potential impact on child survival.

Objectives:

1. To assess the infant and young child feeding (IYCF) practices among mothers
2. To evaluate the various indicators of infant and young child feeding practices among the same group.
3. To impart knowledge about appropriate infant and child feeding practices to the mothers.

Materials And Methods: A community based cross-sectional study among mothers of children aged 0-23 months attending the Anganwadis in a selected area of the rural health centre of Travancore Medical College, Kollam. A pre-tested structured interview schedule was used for the purpose.

Analysis: Data was entered into Microsoft Excel and analyzed by SPSS version 16

Results: Out of 50 children studied more than half were females and most of them belonged to birth order less than 2.There was early initiation of breast feeding and exclusive breast feeding in 60% of children. Colostrum was given to 78% children. Only 32% were given prelacteal feeds. 83% of children in the 12-23 months age group were still breastfed. Iron rich food was given to only 52.1% children. All the children studied had Minimum Meal Frequency (MMF). Minimum Meal Diversity (MMD) and Minimum Acceptable Diet were observed in 91.3%.

Conclusion: It is clearly evident from our study that the IYCF indicators; core and optional indicators showed acceptable values.

Key words: IYCF, Anganwadi, Minimum meal frequency, Minimum Meal Diversity,Minimum acceptable diet.

INTRODUCTION

Worldwide, around 10.9 million children under the age of 5 years die every year, of which 2.4 million deaths occur in India alone. {1} Malnutrition underlies a majority of these under 5 deaths, 70% of which occur in the first year of life. Nearly 67% of the child deaths in India are due to the potentiating effects of malnutrition. {2} Suboptimal breastfeeding accounts for death of 1.4 million children every year. {3} Of all proven preventive health and nutrition interventions, IYCF has the single greatest potential impact on child survival. Optimal infant and young child-feeding practices are crucial for nutritional status, physical and mental growth, development, health, and ultimately the

survival of infants and young children. Infants aged 0-5 months who are not breastfed have 7-fold and 5-fold increased risks of death from diarrhea and pneumonia, respectively, compared with infants who are exclusively breastfed. {4} At the same age, nonexclusive rather than exclusive breastfeeding results in more than 2 fold increased risk of dying from diarrhea or pneumonia. {5}

India is home to more than a third of the world's undernourished children.In1999, the National Family Health Survey(NFHS II) found that 47% of all children under age three were under weight. {6} Data from NFHS-3 (2006) shows only a very small decline, with under-nutrition level remaining around 45 percent for children below three. {7} Despite vast improvements in the country's economy, undernutrition remains a challenge in India.

Most of the studies conducted in India have focused mainly on the breastfeeding aspects and not dietary diversity and diet frequency aspects which are important in IYCF .It was against this background that this study was conducted in a selected rural area of Kollam.

MATERIALS AND METHODS

A community based cross-sectional study was conducted in a rural setting of Kollam from Nov 2014 to Jan 2015. The study population included mothers of children 0-23 months attending the anganwadis under the field practice area of the rural training centre of Travancore Medical College, Kollam. The mothers attending the anganwadis were selected using systematic random sampling technique. The inclusion criteria included mothers of children aged 0- 23 months & exclusion criteria were those unwilling to cooperate with the study.

Data Collection: With due permission from the Principal TMC, Kollam, Professor and HOD, Community Medicine and with the Ethical committee approval, data was collected. A pre-tested, structured interview schedule based on the standard questionnaire on IYCF by WHO was used for the purpose. The data regarding the socio-demographic profile of the mothers and feeding pattern among the mothers regarding breast feeding, minimum meal frequency, minimum dietary diversity, minimum acceptable diet and the inclusion of various iron rich foods in the diet of the child was collected.

Analysis: Data was entered into Microsoft Excel and analyzed by SPSS software version 16.

RESULTS

The study was a rural community based one involving 50 children aged 0-2yrs out of which 46% were male children and 54% female children. 27 children (54%) belonged to 0-5months age group and 23 children (46%) belonged to 6-23 months category. Regarding the maternal literacy 16% were educated up to middle school, 20% till high school, 30% higher secondary, 28% were graduates and post graduates and 6% professionals. 46% were unemployed. 42% were skilled workers, 6% semi-professionals and 6% professionals.

Table 1: Age and Sex distribution of the study population

Sex	0-5 months	6-23 months	Total
Male	12 (24%)	11 (22%)	23 (46%)
Female	15 (30%)	12 (24%)	27 (54%)
Total	27 (54%)	23 (46%)	50 (100%)

Table 2: Maternal educational status

Education	frequency	Percentage (%)
Middle school	8	16
High school	10	20
Higher secondary	15	30
Graduate/post graduate	14	28
Profession	3	6
Total	50	100

Birth order was tabulated as birth order <2 and birth order of >2 and was found to be 62% and 38% respectively. 40% of children of birth order <2 belonged to age group 0-5 months and 22% to 6-23 months. 14% of children of birth order >2 belonged to age group 0-5 months and 24% were in the 6-23 months. In our study

60% of children were put on breastfeeding in the recommended time. Compared to other similar studies, ours was a quite high percentage. NFHS-3 data at national level and at Delhi showed EIBF as 23.4% and 21.7% respectively. In our study, pre-lacteal feeds were given to only 32% of children. This is less compared to similar study in Delhi (38%). {8} And even lesser compared to NFHS-3 data at Delhi (45.7%). {9} Water was the pre-lacteal feed to 54% of children and honey to 44%.

In our study 78% of children were given colostrum. Breast milk is a good source of all nutrients required for the baby in the initial few months of life. In our study, 60% of children were exclusively breast fed. Remaining 40% were premature infants who were provided with additional foods on their doctor's advice. Compared with other studies this is a high percentage, NFHS-3 data at national level and Delhi showed 46.4% and 34.5% respectively. Studies have proved that children who received solid and liquid foods along with breast milk are at increased risk of infectious disease under nutrition.

Table 3: Feeding practice indicators of the study population

Sl.no	Feeding practice indicators	Yes (%)	No (%)	Total
1.	Early initiation of breast feeding	30 (60%)	20 (40%)	50
2.	Prelacteal feeds	16 (32%)	34 (68%)	50
3.	Colostrum	39 (78%)	11 (22%)	50
4.	Exclusive breast feeding	30 (60%)	20 (40%)	50
5.	Bottle fed <6 months 6 – 23 months	 9 (18%) 13 (26%)	 18 (36%) 10 (20%)	 27 23
6.	Continued breast feeding 12-23 months	 15(83.3%)	 3(16.7%)	 18

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Bottle feeding was observed in 44% of total children studied, out of which 18% were children aged less than 6 months and 26% were children aged 6-23 months. Other studies had reported lesser prevalence of bottle feeding than our study. A study from Delhi reported it to be 26.5%. {10}

Continued breastfeeding at 12-23 months was being observed in 83.3%. A study from Delhi showed that it was 72.1% and from West Bengal was 91.1%.

Minimum meal frequency was observed in 100% of children aged 6-23 months. In a study from Delhi, minimum meal frequency was observed in 48.6%children aged 6-23 months. NFHS-3 data from Delhi reported that only 55% of children are fed minimum number of times a day. {11}

Minimum dietary diversity was present in 91.3% of children aged 6-23 months. This is quite high compared to a study in Delhi showing only 32.6%. {12} This indicator evaluates whether the child is receiving a balanced diet or not. NFHS-3 data from Delhi has reported that only 48% are fed with appropriate number of food groups.

Minimum acceptable diet was found to be adequate in 91.3 % of children aged 6-23 months. Study from Delhi had it as low as 19.7%. This indicator is the proportion of children aged 6-23 months who receive at least the MDD as well as the MMF accordingly. NFHS-3 data from

Delhi showed that only 34% of children in Delhi had minimum acceptable diet.

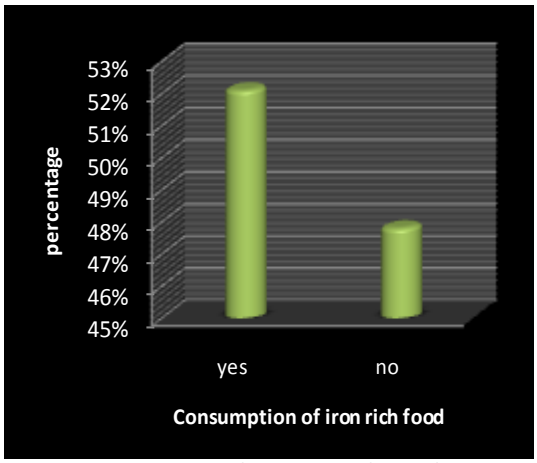

Figure1: Consumption of iron rich food of the study population

Table 4: IYCF indicators of the study population.

Sl.no	Indicators	Frequency
1.	Minimum meal frequency	23 (100%)
2.	Minimum dietary diversity	21 (91.3%)
3.	Minimum acceptable diet	21 (91.3%)

CONCLUSION

It is clearly evident from our study that the IYCF indicators; core and optional indicators showed acceptable values. Out of 50 children studied more than half were females and most of them belonged to birth order less than 2. All the mothers included in the study were literate and 64% were educated up to higher secondary. Regarding the IYCF indicators, early initiation of breast feeding and exclusive breast feeding was there in 60% of children. Colostrum was given to 78% children. Only 32% were administered prelacteals. 83% of children of 12-23 months age group were still breastfed. Iron rich food was given to only 52.1% children and this was the only parameter that was quite backward in our study. Its noticeable that all children studied had Minimum Meal Frequency (MMF). Minimum Meal Diversity (MMD) and Minimum Acceptable diet was observed in 91.3%. Comparing our study with other similar ones, the status of IYCF practices in our study was far better.

RECOMMENDATIONS

The following recommendations were made based on the results of our study:-

1. Early initiation of breastfeeding and exclusive breastfeeding was there only in 60% of children studied. Since breast milk is the best ever food available in this world, we recommend that these two be entertained by mothers at the right time and for right duration.
2. Consumption of iron rich food was there only in 52 % children of 12-23 months age group. So iron rich food like ragi, jaggery, dates, has to be included in their diet.
3. Colostrum is the first breast milk containing nutrients as well as immunoproteins essential for the baby. In our study only 78% were given colostrum. The mothers to be must be educated about the importance of colostrum administration in the antenatal period itself.
4. Our study stands out to be the latest evidence that the custom of prelacteal feeding still exist. So we insist that this practice be abandoned as it has nothing good for the baby rather harmful.

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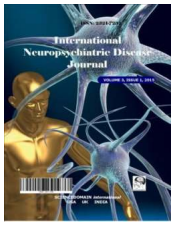

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A Case-control Study to Identify the Risk Factors of Dementia among Clinically Diagnosed Patients in Kerala

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Context: Dementia is one of the most significant challenges of the 21st century because of its health, social and economic impact. In India over 4.1 million people are affected. Dementia still remains a largely hidden problem in India. There is gross ignorance, neglect and scarce services for people with dementia and their families, especially in the disadvantaged parts of India.
Objective: To identify the risk factors of dementia among the residents of ARDSI (Alzheimer's and related Disorders Society of India) Centers in Kerala.
Materials and Methods: A case control study involving 51 clinically diagnosed dementia patients from four ARDSI Centers in Kerala were considered as cases and 102 age and gender matched controls were selected from neighborhood.
Using a pretested structured interview schedule the risk factors of dementia were identified.
Results: 51 cases and 102 controls participated in this study. The dementia patients who were in the 70–79 age group constituted 43%.Among the women with dementia 18% were widows. Multiple logistic regression analysis showed that important determinants of dementia were increasing age, married status, family history of dementia and hypertension.

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Conclusion: The public awareness about dementia in India is low. A better understanding & identification of the risk factors of dementia which would protect/reduce the risk of dementia is essential for controlling this silent epidemic.

Keywords: Dementia; case-control; Alzheimer's disease; risk factors; ARDSI.

1. INTRODUCTION

According to World health organization the developing countries of the world by 2025 will account for the majority of elders in the world, China and India contributing nearly a fifth [1]. India has 4.1 million people with Alzheimer's disease (AD) and related dementias and this is expected to double by the year 2030 [2]. Reports indicate that in 2010, more than half (57.7%) of all people with dementia lived in low and middle-income countries. This proportion is expected to rise to 63.4% in 2030 and to over 70% in 2050. The joint report by the World Health Organization and Alzheimer's Disease International which published these figures has gained wide international attention [3]. Dementia is a growing problem in aging population. Within the next five years, it is expected that the number of adults aged 65 and over will outnumber children under the age of 5 and by the year 2050 older adults will outnumber children under the age of 14 [4].

In India the number of people with Alzheimer's disease and other dementias is increasing every year because of the steady growth in the older population and stable increment in life expectancy and it is expected to increase two-fold by 2030 and three-fold by 2050 [5]. Dementia is characterized by loss of or decline in memory and other cognitive abilities and reduces the lifespan of affected people. Dementia is often associated with physical, mental and financial burden and evidence suggests that elderly people with dementia in developing countries do not often utilize health care services, and when they do, the health care system is often ill prepared to provide quality services for dementia. Around 10-37% of the elderly population with dementia in developing countries is classified as having potentially vulnerable living circumstances with requiring long-term and specialized care [6-12]. Approximately 2% of cases start before the age of 65 years [13]. After this, the prevalence doubles with every five year increment in age. Dementia is one of the major causes of disability in late-life.

Various risk factors have been found to be associated with dementia and Alzheimer's disease. Of note, many recognized vascular risk factors for ischemic heart disease and/or stroke are also risk factors for dementia. Although some potentially reversible conditions such as hypothyroidism or vitamin B-12 deficiency are often considered to be causes of dementia, no more than 1.5% of cases of mild to moderate dementia are fully reversible [14]. Diabetes, hypertension, smoking and obesity have all been found to increase dementia risk. While vascular risk factors and cerebrovascular diseases clearly underlie vascular dementia, an etiological role for vascular changes in Aβ deposition and hence Alzheimer's disease remains unclear [15]. Alzheimer's disease is a complex disorder for which there is currently no known prevention or cure. Some research has generated hope that one day it might be possible to slow the progression of Alzheimer's disease, delay its symptoms or even prevent it from occurring at all. Although there is preliminary data to support the benefit of some interventions, such as physical activity and cardiovascular risk reduction, nothing at this time has definitively been shown to prevent Alzheimer's disease or other dementias.

Identification of risk factors for Alzheimer's disease is important because they can indicate lifestyle choices that can help reduce a person's chance of developing the disease. Some factors are beyond individual control, while other important risk factors can be reduced through appropriate lifestyle.

Despite the magnitude of this problem, there is gross negligence, neglect and scarce facilities for the care of people with dementia. Given the demographic transition and the disintegration of the joint families in many parts of the country, diseases such as dementia are emerging as a major public health challenge.

1.1 Objectives

To identify the risk factors of dementia among the residents of Alzheimer's and related Disorders Society of India (ARDSI) Centres in Kerala.

2. MATERIALS AND METHODS

The study was conducted among the residents of four ARDSI centres in Kerala after obtaining consent from the concerned authorities. ARDSI, established in 1992, is a non-government organization which has spearheaded the dementia movement in India. ARDSI has been in the forefront as a registered national, non-profit, voluntary organization engaged in the care, support, training and research of dementia since its inception in 1992. ARDSI is actively involved in developing services. Currently there is a Day Centre (Cochin) and three full time care homes (Cochin, Kunnamkulam, Calicut) for people with dementia run by the national office in Kerala, and another center is being run by the Thiruvananthapuram Chapter. Professional care is provided to the residents by trained carers round the clock. The staff provides various therapies to the residents such as cognitive stimulation, light exercises, yoga, music therapy and reality orientation. They were selected from four districts of Kerala namely Thiruvananthapuram, Kottayam, Ernakulam and Kozhikode. All the residents in these four centres were selected which accounted for fifty one clinically diagnosed dementia patients. The controls were people matched for age, socioeconomic status, education and they were 102 in number and were matched for age, gender, and socio-economic status.

2.1 Study Design

The residents of the ARDSI centres had undergone a two phase study which included a screening phase and a diagnostic confirmation phase. The screening phase included an evaluation of the cognitive status using the MMSE (Mini Mental State Examination) the most commonly used and studied test which had acceptable accuracy [16] and the Pfeiffer questionnaire (SPMSQ) [17]. Individuals with a score of less than 24 points were considered positive and went to the following phase. Those people suspected of having dementia were evaluated by a Neurologist by using a structured history and clinical examination which included the CDR (Clinical Dementia Rating) scale. The Neuropsychiatric Inventory was used to evaluate the behavioural symptoms [18]. Further evaluation tests for reaching a diagnosis like blood investigations (Haemogram, Thyroid function Tests, Vitamin B12) and or a CT / MRI was done. The final diagnosis of dementia was made based on the DSM-1V criteria (American Psychiatric Association).

The care co-ordinator of each centre was interviewed using structured interview response schedule. The details of each patient was well-documented on admission at the ARDSI centre and any further doubts were cleared by the immediate close respondents of the residents. The data base of the residents were obtained from the centres which included the socio-demographic data, the risk factors of dementia such as family history of dementia, diabetes, hypertension, smoking, alcoholism and head injury.

The controls were selected from neighbourhoods of the respective residents who were matched for age, gender, education. 102 controls were selected for the study.

The study was conducted for one month period from October –November 2011.

2.2 Statistical Analysis

The SPSS version16 for windows was used for the statistical analysis. The rates and ratios were calculated. Frequencies were calculated for each of the risk factors in cases of dementia and in controls. To evaluate the association between risk factors of dementia, multiple logistic regression was used and adjusted odds ratios were calculated. Univariate analysis of factors associated with cases and controls was created. In this model each of the risk factors like family history of dementia, diabetes, hypertension head injury and smoking were included. A second model was created and the risk factors like age, gender, marital status, smoking, and hypertension were included simultaneously to determine the independent effect of each one of them.

3. RESULTS

The study included 51 diagnosed cases of dementia and 102 controls who had no dementia. The socio-demographic factors of the participants are shown in Table 1. Among the cases 43% belonged to the 70-79 age group, 37.3% were graduates, 53% were married and 49% came from the high–income group. The proportion of unmarried people and widows/widowers were higher (47%) in the

dementia group when compared to the controls (17%).

Alzheimer's disease (AD) was the most commonest type of dementia among the cases-74.5% (Fig. 1).

Among the socio-demographic factors age, marital status and family income showed a significant relationship to dementia. Increasing age was directly proportional to increase in the prevalence of dementia, Gender was not significantly associated with dementia. Poor education, unemployment and type of family had no significance to dementia in this study.

The effect of risk factors among cases and controls when examined showed that family history of dementia (<0.01) and hypertension (p=0.003) had an association with dementia (Table 2).

In the univariate model family history of dementia (OR = 3.17 p<0.003), hypertension (OR=3.29: p< 0.33), and head injury (OR= 3.04 p<0.033) were found to be risk factors of dementia (Table 3).

The multiple logistic regression analysis showed that the following risk factors had significant association with dementia (Table 4).

Table 1. Socio-demographic characteristics of cases and controls

Variable	Cases	Controls	P value
Age group			
50-59	3 (5.9%)	0 (0.0%)	
60-69	9 (17.6%)	62 (60.8%)	
70-79	22 (43.1%)	34 (33.3%)	< 0.001
80-89	16 (31.4%)	6 (5.9%)	
90-99	1 (2.0%)	0 (0.0%)	
Total	51 (100.0%)	102 (100.0%)	
Gender			
Male	26 (51.0%)	61 (59.8%)	
Female	25 (49.0%)	41 (40.2%)	0.306
Total	51 (100.0%)	102 (100.0%)	
Education			
Primary	9 (17.6%)	15 (14.7%)	
Secondary	16 (31.4%)	22 (21.6%)	
Graduate	19 (37.3%)	36 (35.3%)	0.178
Post graduate	7 (13.7%)	29 (28.4%)	
Total	51 (100.0%)	102 (100.0%)	
Occupation			
Unemployed	19 (37.3%)	32 (31.4%)	
Unskilled	1 (2.05)	10 (9.8%)	
Skilled	15 (29.4%)	22 (21.6%)	0.216
Professional	16 (31.4%)	38 (37.3%)	
Total	51 (100.0%)	102 (100.0%)	
Family income			
Low Income Group	2 (3.9%)	18 (17.6%)	
Middle Income Group	24 (47.1%)	37 (36.3%)	**< 0.001**
High Income Group	25 (49.0%)	47 (46.1%)	
Total	51 (100.0%)	102 (100.0%)	
Marital status			
Married	27 (52.9%)	83 (81.4%)	
Unmarried	4 (7.8%)	5 (4.9%)	**< 0.001**
Widow/Widower/Divorce	20 (39.2%)	14 (13.7%)	
Total	51 (100.0%)	102 (100.0%)	
Type of family			
Nuclear	29 (56.9%)	54 (52.9%)	
Joint	22 (43.1%)	48 (47.1%)	0.731

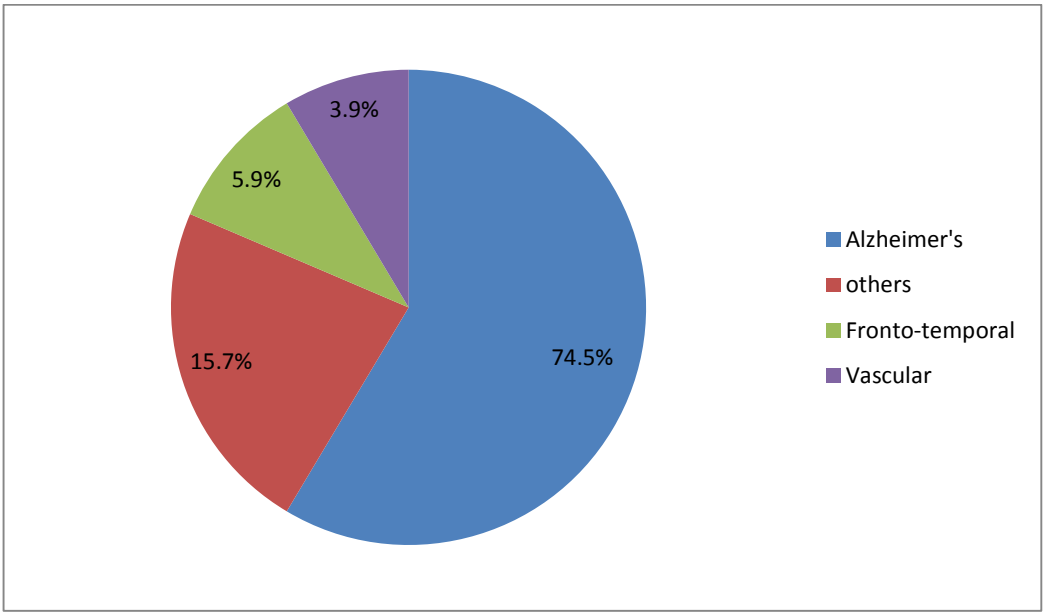

Fig. 1. Type of dementia cases

Table 2. Frequency of the risk factors in the study population

Habits	Cases	Controls	P value
Smoking	6 (11.8%)	12 (11.8%)	
Alcoholism	2 (39%)	7 (6.9%)	
Both	4 (7.8%)	6 (5.9%)	
Nil	39 (76.5%)	77 (75.5%)	0.872
Diabetes			
Yes	19 (37%)	43 (42.2%)	
No	32 (63%)	59 (57.8%)	0.603
Hypertension			
Yes	13 (25%)	52 (51%)	
No	38 (75%)	50 (49%)	0.003
Head Injury			
Yes	2 (3.9%)	0	
No	49 (96.1%)	102 (100%)	0.333
Family History			
Yes	4 (7.8%)	0	0.01
No	47 (92.2%)	102 (100%)	

Table 3. Univariate analysis of risk factor association with cases and controls

Characteristics	Categories	Cases	Controls	p value	Odds ratio (95% CI)
Family history of	Yes	4 (7.8%)	0 (0.0%)	0.01	3.170
Dementia	No	47 (92.2%)	102(100.0%)		
Diabetes	Yes	19 (37.3%)	43 (42.2%)	0.603	0.815
	No	32 (62.7%)	59 (57.8%)		
Hypertension	Yes	13 (25.5%)	52 (51.0%)	0.003	3.29
	No	38 (74.5%)	50 (49.0%)		
Head injury	Yes	1 (2.0%)	0 (0.0%)	0.033	3.040
	No	50 (98.0%)	102 (100%)		
Smoking	Smokers	10 (19.6%)	18 (17.6%)	0.826	1.12
	Non smokers	41 (80.4%)	84 (82.4%)		

Table 4. Regression model showing association with Alzheimer's disease

Characteristics	Ad. odds ratio (95% CI)	P value
Age	1.09 (0.161 – 4.195)	**0.001**
Marital status	6.103 (2.30 – 16.18)	**0.001**
Hypertension	0.279 (0.125 – 0.626)	**0.002**
Smoking	1.578 (0.561 – 4.395)	0.383
Gender	1.450 (0.582 – 3.611)	0.425

1. Increasing age
2. Being unmarried or widowed/widower
3. Hypertension

Family history of dementia showed a statistical significance in the univariate analysis but lost its significance in the multivariate analysis.

4. DISCUSSION

The objective of this study was to identify the risk factors of dementia among clinically diagnosed cases of dementia assessing socio-demographic, genetic, medical and lifestyle exposure. Since the dementia cases were already confirmed cases the problem of misdiagnosis could be avoided. The controls were selected within similar geographical region. Comparison was sought for age and socioeconomic factors between the cases and controls. The risk factors which were to be assessed were not matched.

The study showed that as age increases the risk of dementia also increase. Between 65 and 85 years of age, the prevalence doubles every 5.2 years following an exponential model. [19,20,21,22]. A meta-analysis that included 17 Chinese studies has also shown that the prevalence of dementia increases with age [23] Our study supports this hypothesis as increasing age was a risk factor for dementia. Female gender was not an independent risk factor in our study as demonstrated by some authors [24]. However, others have not found differences between genders, and when it occurs is at very advanced ages (over 90 years of age [25]. Alzheimer's disease was the most common subtype of dementia among the study population which is at par with other studies [26]. In this study education did not show any relationship to the development of dementia whereas in some studies [27,28] lower education was a risk factor for the onset of dementia. Prevalence of dementia was seen more among the unmarried group when compared to the controls which was comparable to a community survey done in Kerala [29] where the prevalence was more among unmarried or single group which needs to be further explored. There was little difference between cases and controls for educational attainment in a study done as part of the Rochester epidemiological study by Mary Beard et al. (2006). A family history of dementia is usually a risk factor for dementia. In this study it was significantly associated with dementia in the univariate model but lost its significance during the regression analysis which was consistent with some other studies [30–33]. Hypertension was an independent risk factor for dementia in this study. Other authors also have demonstrated a similar significant association [34]. Diabetes had no association with dementia in our study which was similar to the Canadian study of health and aging [35]. Traumatic brain injury can induce the early development of AD [36]. A meta-analysis that included 15 case–control studies has found that head injury is associated with an elevated risk of AD among men but not women [37]. We found no association of head injury with dementia in our study. A recent meta-analysis has shown that current smoking is associated significantly with an increased risk of AD but not with vascular dementia and cognitive decline [38] which was not found in this study. Two follow-up studies [39] in the United States and one in China [40] have reported a significant association between current smokers and the risk of dementia.

5. CONCLUSION AND RECOMMENDA-TIONS

The strength of our study was that it paved a way for better understanding of the risk factors and also identification of factors which protect or reduce the risk of dementia. Public awareness about dementia is low. Hence it has to be promoted. The key role of families of dementia patients & the caregivers should be recognized.Government policy for making dementia a health priority should be given importance.

6. LIMITATIONS

- The evaluated population size was small and the the strata of population selected

was mainly from the middle income group which might not represent the actual population.

- Kerala has a high prevalence of diabetes and hypertension.
- Since diabetes and hypertension are suspected risk factors of dementia matching was not done as its role in the study would have been eliminated.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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