Comparison of children at-risk for auditory processing disorder between urban and rural schools

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Register No.: 15AUD025

This Dissertation is submitted as part of fulfillment

for the Degree of Master of Science in Audiology

University of Mysore, Mysuru

ALL INDIA INSTITUTE OF SPEECH AND HEARING

MANASAGANGOTHRI, MYSURU-570006

May, 2017

CERTIFICATE

This is to certify that this dissertation entitled *"**Comparison of children at-risk for auditory processing disorder between rural and urban schools"*** is a bonafide work submitted in part fulfillment for degree of Master of Science (Audiology) of the student Registration Number: 15AUD025. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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DECLARATION

This is to certify that this dissertation entitled *"**Comparison of children at-risk for auditory processing disorder between rural and urban schools"*** is the result of my own study under the guidance of Dr. Asha Yathiraj, Professor of Audiology, Department of Audiology, All India Institute of Speech and Hearing, Mysuru, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysuru, **Registration No.: 15AUD025**

May, 2017

Dedicated

to

my Appa and Amma

Acknowledgements

"Gratitude is the healthiest of all human emotions. The more you express gratitude for what you have, the more likely you will have even more to express gratitude for."

– Zig Ziglar

Firstly I would like to express my gratitude to my guide Prof. Asha Yathiraj for her constant support and guidance.

The word thank you is not enough to express my gratitude when it comes to my supporting pillars-my appa and amma, for being the world's greatest and best parents ever. You both never said 'no' for anything to me, thanks for providing all that I need. Thank you both for all the love, care, affection and support given. Love you both. Amma, without your support my dissertation would have been incomplete. Thanks for roaming with me to all the schools for data collection. Special thanks to my Doddamma and Sumathi akka, who made my data collection to go on smoothly and quickly.

With all respect, I would like to thank all my primary school teachers and JNV teachers for moulding me into what I am today.

I would like thank to Dr. Sandeep. M, HOD of Audiology for permitting me to carry and utilize the instruments for the study. I would also like to thank Sharath sir and Ravi sir for their timely support.

I would like to thank all the principals, teachers and energetic chotus for being kind and cooperative participants in the study. A special thanks to DDPI of Mysuru and Chamarajanagara for permitting me to carry out my study in government schools under their supervision.

A special thanks to Dr. Vasanthalakshmi for helping out in statistical analyses. Thanks to Shreyank anna and Divya di for duly support and guidance during review.

Sonal, big thanks to you for being with me throughout my dissertation. You were always there for me whenever I was in need, my energy booster. Thanks for everything Nona.

I owe a huge thanks to my cute Kuchku for helping me out in data entry and thanks to Sujan and Gowtham for their timely support.

Swaaaa, I thank you for being with me all the time since 6 years. I have had crazy memories with you- cooking, chit chating, late night talks which lasted upto next mornings, outings etc.

Special thanks to my Inchu and Pinchu, whose activities made me forget all my tensions. You were the reason for my calmness all the time.

I thank my dissertation partners, Sonal and Priya for being together always and sailing in the same boat. Going to miss those long talks and snacks time which lasted for hours together.

A special thanks to Ajith for encouraging me constantly to face everything that comes in life. I owe you a lot for always being there to help and support me.

I would also like to thank all my friends and family members for being with me always. I am grateful to my brother Swamy for always helping me to choose right path in life and making me emotionally strong.

Last but not the least, I would like to thank lord almighty for showering his blessings on me.

Thank you all!!!

ABSTRACT

Aim: The aim of the study was to compare the number of children at-risk for APD between rural and urban schools, determine the link between children at-risk for APD and family literacy / educational support as well as to determine the knowledge of APD in teachers across rural and urban schools.

Methods: The study was carried out in three phases. In the first phase, two different questionnaires were developed related to teachers' knowledge of APD, family literacy and educational support provided to the children at home. The second phase involved evaluation of knowledge regarding APD from 92 teachers (37 teachers from rural & 55 teachers from urban areas). In the third phase, 2029 primary school-going children from rural (N = 899) and urban (N = 1130) government schools were screened using SCAP. Information on family literacy and educational support provided at home for all the participants were obtained from the teachers.

Results: A significantly higher number of children at-risk for APD was found in rural government schools that in the urban government schools. In the urban schools, a significant difference in number of children at-risk for APD was noted among age groups, whereas no such difference was observed in rural schools. Further, a significant negative correlation was seen between educational support / family literacy and SCAP scores of the children, with its being moderate in rural and weak in urban schools. Additionally, family literacy and educational support were found to be higher in rural schools than urban schools in children who were not at-risk for APD. However, in children at-risk for APD, educational support was observed to be more in rural than urban areas but family literacy was similar across both locations.

It was further noted that teachers in rural schools had more knowledge of APD when compared to teachers in urban schools. Also, a significant negative moderate correlation was found between years of experience and knowledge of APD in teachers from rural schools. However, no such difference was noticed in urban school-teachers.

Conclusions: From the present study, it can be concluded that family literacy and educational support given to children at home may influence the presence of symptoms of APD present in children. It needs to be further evaluated whether symptoms of APD influence the educational outcome of children in schools.

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Chapter 1

INTRODUCTION

Education is known to be of paramount importance in moulding the personality and confidence of individuals. It has been considered essential for an individual to succeed in life (McKay, 2015). Studies carried out in India indicate that the dropout of children from school varies depending on the region. Across states of India as well as across districts within a stage, the dropout varies. It has also been shown that the number of children educated in rural and urban areas varies. The dropout rate has been also seen to vary depending on the grade in which children study (Chigari, Angolkar, Sharma, Faith, & Kumar, 2015; Gouda & Sekher, 2014; Minz, Jain, Soni, & Ekka, 2015; National Sample Survey Organisation, 2014; Sarva Shiksha Abhiyan, 2013; Sarva Shikshana Abhiyan Karnataka, 2010).

National level studies conducted in India indicate that the dropout rate in schools ranges from 2.54% to 13.7% (Census of India, 2011; Gouda & Sekher, 2014; National Sample Survey Organisation, 2014; Pratham Education Foundation, 2013; Sarva Shikshana Abhiyan Karnataka, 2010, 2013). This dropout rate has been noted to be higher in rural areas compared to urban areas (Gouda & Sekher, 2014; National Sample Survey Organisation, 2014; Sarva Shikshana Abhiyan Karnataka, 2010, 2013). Additionally, it has also been seen that the dropout is more in higher grades compared to lower grades (Chigari et al., 2015; Minz et al., 2015; Sarva Shiksha Abhiyan, 2013).

Christle, Jolivette, and Nelson (2007) observed a strong relation between academic achievement and school dropout rates. Several reasons have been attributed

for children dropping out of school. Studies carried out India reported poor academic performance, lack of interest in studies and repeated failures as major contributing factors for school dropouts (Chigari et al., 2015; Gouda & Sekher, 2014; Govindaraju & Venkatesan, 2010; Minz et al., 2015; National Sample Survey Organisation, 2014; Patil & Malagi, 2013; Pratinidhi, Kurulkar, Garad, & Dala, 1992; Sarva Shiksha Abhiyan, 2013). In addition to it, factors like low socioeconomic status, literacy of the parents and domestic duties were also found to result in school dropouts (Chigari et al., 2015; Malik, Biswas, Mitra, & Chaudhury, 2002; Minz et al., 2015; Pratinidhi et al., 1992; Sarva Shiksha Abhiyan, 2013). Thus, it can be observed that the majority of reports in India state poor academic performance to be a factor for children dropping out of school.

Studies speculate that auditory processing disorder (APD) could be one of the factors that negatively influence the academic achievement of children (Bellis, 1996; Bellis & Ferre, 1999; Rosen, Cohen, & Vanniasegaram, 2010). Hus (1997) reported that APD is frequently diagnosed in children who have problems in pursuing their studies despite having normal hearing and cognitive abilities. Further, the presence of difficulties in language and reading abilities has been observed in children having APD (Cacace & McFarland, 1998; Katz, 1994; Sharma, Purdy, & Kelly, 2009; Wit et al., 2016).

Additionally, western studies indicate that the prevalence of APD in school-going children is 2 to 5% (Chermak & Musiek, 1997; Silman, Silverman, & Emmer, 2000). Additionally, the ratio of APD was observed to be 2:1 among boys and girls

(Chermak & Musiek, 1997). Further, Muthuselvi and Yathiraj (2008-09) found 3.2% of school-going children to be at-risk for APD in India.

Thus, from the literature it can be seen that a high percentage of children in the western world as well as in India have or are at-risk for APD. Also, from the literature it can be observed that a large percentage of children, especially in India, are out of school. Dropout rate was found to be high in rural schools than in urban schools. Additionally, poor academic performance was found to be a prime factor resulting in school dropout. Studies in literature speculated that APD could be one of the causes for poor scholastic performance in children.

Need for the study

The review of literature indicates that a large number of children in India are at-risk for APD (Muthuselvi & Yathiraj, 2008-09). Additionally, surveys carried out in India report that a large number of children drop out of school (National Sample Survey Organisation, 1998, 2014; Reddy & Sinha, 2010; Sarva Shiksha Abhiyan, 2013). Although this percentage has been reported to have reduced over the years, it still continues to be high. Several reports in India maintain that the dropout rate is higher in rural schools compared to urban schools. However, none of the studies have evaluated whether there exists a difference in the number of children at-risk for APD in rural and urban schools. Hence, this needs to be determined as it is possible that there may be a link between dropout rate of school children and APD.

Further, it needs to be evaluated if there is a link between the presence of symptoms of APD in children and aspects that are known to aid in academic

performance. These aspects include literacy level of the family, the educational support received by children as well as knowledge of teachers regarding APD. Information on whether these aspects differ in rural and urban schools will shed light on the possibility of them having an association with APD. This will enable taking necessary steps so that appropriate remedial measures can be provided.

Aim of the study

The primary aim of the study is to compare children who are at-risk for Auditory Processing Disorder in rural and urban schools. The secondary aims are to compare the literacy level of the family and educational support received by children as well as the knowledge of the teachers regarding auditory processing in rural and urban schools.

Objectives of the study

1. To compare the number of children who are at-risk for APD in rural and urban schools.
2. To compare the number of children who are at-risk for APD across different age groups, within rural and urban schools.
3. To determine the difference in family literacy and educational support received by the children across rural and urban setups.
4. To establish the relation between family literacy / educational support at home for children and their scores obtained in SCAP.
5. To compare the knowledge of teachers regarding Auditory Processing Disorder in across rural and urban schools.
6. To study the effect of experience of teachers on their knowledge of APD.

Chapter 2

REVIEW OF LITERATURE

Listening difficulties due to the presence of an auditory processing disorder (APD) has been reported to lead to social, behavioral and academic difficulties (Dawes & Bishop, 2007). Although it is well established that children with APD have considerable listening difficulties, not much is known about its impact on their education. It is speculated by Bellis (1996) that APD could result in poor academic performance. It may be inferred that if unattended, the presence of APD could result in a child dropping out of school. However, poor academic performance could be because of other variable. Hence, it is important to know the reasons behind a child's poor academic performance so that appropriate help can be provided to them as early as possible. In the following section, besides providing information about the prevalence of APD in children, a review of studies on the academic performance of children with APD is given. Additionally, a review of school dropouts in rural and urban setups, school dropouts across grades, school dropout variation over the years and factors associated with school dropouts are presented.

2.1 Prevalence of CAPD in children

The prevalence of auditory processing disorder in school children at New York is estimated to be around 3 to 5% (Silman et al., 2000). Likewise, in Nottingham, United Kingdom, Hind et al. (2011) report of a 0.5 to 1% prevalence of APD in general population and 5.1% prevalence in a total of 2924 children, who had difficulty in speech in noise perception. However, in a study conducted by Skarzynski et al. (2015) at

Poland on 2,35,664 children with dyslexia using the Dichotic Digit Test, the incidence rate of APD was reported to be 37%. Further, at Chelmsford in England, Kumar, Amen, and Roy (2007) observed that around 10% of the 4000 cases seen in a year by them had normal audiogram in spite of having a complaint of hearing loss, suggestive of an APD. In Delaware Valley, based on the findings of 40,305 children, the prevalence of APD was estimated to be 1.92 per 1000 children with the prevalence being more in children studying in private schools than in public schools (Nagao et al., 2016). Similarly, the prevalence of APD was reported to be 2% to 3% in the school-going children and a ratio was found to be 2:1 between boys and girls (Chermak & Musiek, 1997). Further, in India it was found that 3.2% of school-going children were at-risk for APD (Muthuselvi & Yathiraj, 2008-09).

Although the prevalence of APD is found to vary across studies, it can be observed that a large number of children have the condition. It has been observed that APD in children affects their performance in school (Katz, 1962; Katz & Wilde, 1985; Keith, 1981; Kushner, Johnson, & Stevens, 1982; Stublefield & Young, 1982). The following section provides a review of studies dealing with the academic performance of children with APD.

2.2 Academic performance of the children with APD

Difficulty in understanding speech in the presence of noise, problems in understanding verbal instructions, distractibility, poor attention, and impairments in communication, language and reading and academic difficulties have been observed as

some of the symptoms of APD (Jerger & Musick, 2000). Similar findings were also reported by ASHA in the year 2005.

Among 49 children with suspected APD, 46 were found to have reading disabilities by Sharma et al. (2009). Likewise, Rosen et al. (2010) opined that APD may result in learning difficulties, thereby having a negative impact on language and school performance. They also observed that children who were suspected to have APD had significantly below average reading abilities. Additionally, it was noted by Boets, Wouters, van Wieringen, and Ghesquiere (2007) that poor scores on tests of auditory processing (Gap detection test, Frequency Modulation detection, Tone in Noise detection tasks, & speech perception in noise) intensifies literacy and phonological problems.

Auditory perceptual deficits have been reported to be primarily related to the problems in learning sounds-symbol relationships that are considered the basis of phonics rules (Tallal, 1980). Similarly, Dlouha, Novak, and Vokral (2007) observed that central speech and language disorders are due to the inability of a child to apply language rules to received information. This was considered one of the major association deficits that were closely related with binaural integration disorders. It was also disclosed that children with association deficit showed difficulty in the perception of syntax, semantics and vocabulary. Likewise, other authors reported that auditory perception disorders are often associated with learning disabilities (Haggerty & Stamm, 1978; Katz & Wilde, 1985; McCroskey & Kidder, 1980).

Further, Cacace and McFarland (1998), in a critical review of APD in school-going children, observed a link between temporal processing deficits and difficulties in learning to read. Likewise, children with APD have been reported to have poor performance on the tests of language and reading abilities (Wit et al., 2016), problem in remembering and manipulating phonemes, tasks like reading, spelling, phonemic synthesis and analysis difficult (Katz, 1994), and academic and listening behavior difficulties (Bellis & Ferre, 1999).

From the above literature review, it can be construed that APD may have a negative impact on the educational performance of a child. While most of the studies speculate that APD may have a negative impact on scholastic performance, empirical evidence regarding this relation is sparse. It may be conjectured that poor academic skills due to the presence of APD may be one of the reasons that results in children dropping out of school.

2.3 School dropouts in rural and urban set ups

Studies reported in literature indicate that the dropout rate of children from schools varies depending on the location of the school. The dropout rate has been found to differ in schools located in urban and rural areas. Such a difference has been noted in India as well as in other countries.

In order to determine the school dropout rate in rural and urban areas, Roscigno and Crowley (2001) carried out a national level longitudinal study for 5 years in United States of America. They found that students living in rural areas exhibited lower level of

educational achievement and a higher likelihood of dropping out of high school unlike their non-rural counterparts.

In India, similar findings were regarding dropout rate in rural and urban areas were note by the National Sample Survey Organisation (2014). Data of the states indicated that more children from rural areas (3.13%) were out of school than from urban areas (2.54%). This pattern was observed for all the states of the country except in Madhya Pradesh, Uttar Pradesh and Uttarkhand in the central zone of the country (Table 2.1). The maximum dropout was seen in the state of Uttarkhand (15.64%) and least in the state of Himachal Pradesh (0.21%). In Karnataka, it was observed to be 1.59% in rural and 1.31% in urban schools.

Table 2.1

Rate of school dropouts across zones throughout India.

Zones	**Age range 6 to 13 years (in %)**	
	Rural	**Urban**
Central zone	3.67	4.68
East zone	4.16	3.24
North zone	3.49	2.91
North-east zone	2.63	1.95
South zone	1.03	0.86
West zone	1.3	0.99

Earlier, a survey published by the Sarva Shiksha Abhiyan (2013) also revealed that the dropout rate of school children was higher in rural India compared to urban

India. The dropout rate reported by them was greater than twice of the value reported by the National Sample Survey Organization in 2014. The 2010 report of the Sarva Shikshana Abhiyan indicated that 7.8% of the children were out of school in rural areas and 4.5% in urban areas. However, they reported that the dropout rates were lower in the year 2009 with it being 4.6% in rural and 3.2% in urban areas.

Census of India (2011) reported that out of 20 crores children in the age range of 6 to 14 years, 3 crores children did not go to school and 8.5 crores children dropped out from the school to discontinued their education. It was however noted in the 2011 census that the national annual average dropout rate reduced from 9.1% in 2009-2010 to 6.9% in 2010-2011.

Likewise, the Pratham Education Foundation (2013) noted that around 3.3% of the children in the age range of 6 to 14 years are out of school in India. Additionally, Gouda and Sekher (2014) indicated that around 13.7% and 11.9% of children dropped out from school in rural and urban areas respectively. Their report was based on the analysis of data obtained from National Family Health Survey-3 conducted in 2005-06. They observed that 9% dropped out of primary schools in India, with its varying rates across states. The least dropout was observed in Kerala (1.8%) and the maximum was seen in West Bengal (15.5%).

The average dropout rate in Karnataka was estimated to be 2.56% and 2.96% in the primary education level, while it was 5.40% and 5.05% in the higher primary education level in the academic year 2012-13 and 2013-14 respectively. This information was provided in the annual reports of Sarva Shikshana Abhiyana,

Karnataka in the years 2012-13 and 2013-14, respectively (Sarva Shikshana Abhiyan Karnataka, 2013, 2014).

Earlier, in a study conducted in Karnataka by Govindaraju and Venkatesan (2010) it was reported that the school dropout rate varied across the districts. Districts located in the North-Eastern part of the state were found to have highest dropout rates. The dropout rates were found to be 57.15% in Gulbarga, 20.73% in Belagavi, 14.41% in Bengaluru and 7.71% in Mysuru.

Thus, from the studies it can be noted that the dropout rate was more in the rural areas compared to urban areas. This trend was observed in studies carried out abroad as well as studies executed in India. Within India, there exists a difference in the dropout rate across the different states as well as across different districts within a state.

2.4 School dropouts across grades

Attempts have also been made to determine the dropout rates of students across all grades. In UNESCO (2005) report of developing countries, it was noted that 25% of the children who got enrolled to the first grade did not complete their fifth grade as they dropped out of school. Likewise, Reddy and Sinha (2010) reported that in India more than 27 million children enrolled for class I in the year 1993. However, only 10 million of them reached class X, which was about 37% of those who enrolled. They also found that in more than half the states in the country only 30% of the children reached class X. Similarly, a report by Infochange Education (2015) in India revealed that out of 100 children enrolling for class 1, only 47 children reached class 3, thereby making a dropout rate of 52.7% in primary and elementary schools.

A survey conducted by Sarva Shiksha Abhiyan (2013) across 21 states in India revealed the dropout rates of 2.7%, 2.1% and 23.4% at the primary education, upper primary education and elementary education levels respectively in the year 2008-09 and 3.1%, 2.2% and 24.1% in 2009-10. The grade wise dropout rate indicated higher dropout rates in grade 5 when compared to the rest of the primary grades (Table 2.2).

Table 2.2

Dropout rates across grades in primary school for the year 2008-09 and 2009-10 (Sarva Shiksha Abhiyan (2013).

Grade	2008-09		2009-10	
	In 21 states	Karnataka	In 21 states	Karnataka
1	1.5	1.3	1.0	1.0
2	1.4	1.0	1.4	1.2
3	1.3	0.7	1.4	0.8
4	2.4	1.2	2.1	1.1
5	7.9	4.2	10.1	3.5
Total	2.7	1.6	3.1	1.5

Additionally, Minz et al. (2015) observed that across the states of India, the number of children who dropped out of higher grades was more compared to the lower grades. The prevalence of the dropout rate across primary, middle and high school education was found to be 2.18%, 3.89% and 3.73% respectively. Further, it was noted that in the primary school the dropout rate was 2.7% in 2008-09 and increased to 3.1% in 2009-10. This dropout rate was found to be similar among boys (3.2%) and girls (3%) in the year 2009-10.

Further, as seen in national level reports, the presence of a greater dropout rate in higher grades was also seen in a small sample study (N = 200) carried out in Belagavi

district of Karnataka. It was found that the 4th grade students had the highest dropout rate (21%) compared to other grade students. It was also observed that only 2% of the parents of children who dropped were literate and 98% were illiterate. The highest dropout rate reported was of 22.5% in children aged 13 years, followed by 20% in children aged 12 years. The dropout rate was 12% , 11%, 10.5%, 10%, 8.5%, 3% and 2.5% in children aged nine years, eleven years, ten years, seven years, eight years, fourteen years and six years respectively (Chigari et al., 2015).

The review on dropout across grades indicates that the dropout rates varied across the grades with it being higher in upper grades. This trend was observed in all studies carried out in India in this area.

2.5 Variation in school dropout rates over the years

The Sarva Shiksha Abhiyan (2014) survey indicated that the dropout rate declined by 15.8% in 2008-09 when compared with dropout rate in 2000-01. Additionally, it was reported that in the academic year 2009-10, 9.1% of the students dropped out from classes I to V, with the dropout rate being lower in class I (10.2%) compared to class V (15.9%). This class-wise dropout was found to decrease to 5.4% in class I and 6.4% in class V in the year 2012-13.

A report of the Department of Secondary and Higher Education (DISE) across all the states in India indicated that the average dropout rates were 15%, 13% and 12% in the year 2002-03, 2003-04 and 2004-05, respectively. Later in the academic years 2012-13, 2013-14 and 2014-15, the average annual dropout rates at primary educational

level were reported to have reduced considerably to 4.67%, 4.34% and 4.13%, respectively (District Information System for Education, 2014-15, 2015-16).

From the above literature it can be clearly observed that the dropout rates is more in rural areas than the urban areas; it is more in higher grades compared to lower grades; and it has reduced over the years. Although the dropout rate varies across the states in India, the overall pattern of dropout rate seen at the national level is reflected in reports of individual states / districts within a state.

2.6 Factors associated with school dropouts

It is known that schooling helps to mould the future of a child. However, dropping out from the school may have a negative impact on a child's future achievements. It is necessary to know the reasons behind the dropping out so that appropriate measures can be taken based to eliminate or reduce the effect of the factor resulting in dropouts.

In a study on 196 high schools in Kentucky at United States, Christle et al. (2007) found a strong relation between academic achievement and school dropout rates. Further, Santrock (2007) found that 20% of students leave the school for economic reasons and 5% drops out because of suspension, expulsion and dislike towards the school. Similarly, Kunisawa (1989) found that dropouts usually have low basic academic skills, less educated parents and low socioeconomic status. Additionally, several other studies found the contributing factors for dropping out from the schools to be failure in academics, non-availability of a school, financial problems, forced to leave

schools due to the teachers' behaviour or school environment (Bhanpuri & Ginger, 2003; Khokhar, Garg, & Bharti, 2005; Kronick & Hargis, 1998; Roderick, 1993).

The National Sample Survey Organisation (1998) of India reported that 24.4% of the children drop out from schools due to lack of interest in studies. Also, 22.5% of children dropped out as they were unable to cope with or failure in studies. The National Sample Survey Organisation also reported that there are 34.8% of dropouts in rural areas and 22.8% in urban areas due to lack of interest in education. A survey by Sarva Shiksha Abhiyan (2013) across 21 states in India too revealed that the major factors causing dropouts to be lack of interest in studies, economic condition of the parents, migration of family and the need to help the family in domestic work. Likewise, Gouda and Sekher (2014) observed that at a national level, 29% of the dropouts gave reason of being not interested in studies and 6% of dropouts had repeated failures in their studies.

Pratinidhi, Kurulkar, Garad, and Dala (1992) carried out an investigation in rural Maharashtra, on school dropouts from primary and secondary school children. They reported that 142 (82.5%) out of 172 children who dropped out from school were poor performers and had maximum difficulty in concept formation, followed by numerical ability. They also report of financial problems or unsatisfactory scholastic performance. In similar lines, Minz et al. (2015) carried out a cross sectional study in urban and slum areas of Raipur in Chhattisgarh state in order to determine the reasons for scholastic dropouts. The major determinants found by them that lead to a high dropout were socioeconomic status, mother's education, family violence and poor academic performance. This study also revealed that 9.33% of the children dropout from the school because of poor academic performance like repetition of the same class.

Likewise, Chigari et al. (2015) revealed that 12.5% of dropouts were found due to lack of interest in schooling, whereas 31%, 15.5% and 8.5% were because of poverty, parents' negligence and prolonged illness, respectively. They also suggested that the illiteracy of the parents was a major reason for school dropouts. The findings of the study by Malik et al. (2002) conducted in Kolkata, India was found to be in agreement with the previous study. Malik et al. (2002) found that in India 80% of mothers and 84% of fathers of the dropouts' were illiterate.

Further, in a study conducted at rural areas of Chamarajanagara district of Karnataka on 40 school dropouts, several reasons were found to result in children discontinuing their studies. Some of the reasons for the dropout were failure in academics, non-availability of schools, inaccessibility of schools, extruded by the teachers, poverty, child uninterested in studies, to work for wage/salary, parents not interested in studies, and the child attending domestic duties (Govindaraju & Venkatesan, 2010). Similarly, in a study done at Bijapur in Karnataka, poor examination scores, low attendance, social, economic and educational causes were found to result in grade repetition (Patil & Malagi, 2013).

Scholastic performance of children is suggested to be influenced by parental education and attitude. Haveman and Wolfe (1995) reported that the educational level of the parents plays a major role in predicting the children's achievement. Further, Halle, Kurtz-Costes, and Mahoney (1997) observed that mothers with higher educational level had higher expectations with respect to academic achievement of their children and these expectations subsequently resulted in better performance. These findings are in consensus with the findings of Corwyn and Bradley (2002) who revealed

a consistent direct influence of maternal education on cognitive and behavioural outcomes of the children.

To summarize, poor scholastic performance, lack of interest in academics and repeated failures are considered to be the major reasons for dropouts. In addition, parental negligence, low literacy level of parents and low socioeconomic status are also indicated as causative factors of dropouts. A few other uncommon factors include being rejected due to the teachers' attitude, inaccessibility to schools, domestic duties and low attendance. It is also speculated that auditory processing disorder might result in poor academic performance. Therefore, APD being a cause for poor academic performance may result in increased rate of school dropouts. Thus, it is essential to investigate the underlining cause(s) for increased school dropouts, which in turn would help to identify and provide necessary intervention for children with APD.

Chapter 3

METHODS

The study was carried out as a survey with the primary aim of comparing children studying in rural and urban schools who are at-risk for Auditory Processing Disorders (APD). The secondary aim of the study was to compare the knowledge of teachers about APD across rural and urban schools. The study was designed to have three phases, where the first phase involved the development of questionnaires to determine the knowledge of school teachers regarding auditory processing disorder as well as determine information about the educational background of the family and educational support given to the children. The second phase entailed the assessment of the knowledge of teachers regarding auditory processing disorder. The third phase involved administration of the 'Screening Checklist for Auditory Processing' (SCAP-Yathiraj and Mascarenhas, 2004) by school teachers.

3.1 Participants

For Phase 1 of the study, 10 professionals consisting of 05 audiologists and 05 special educators were involved in the content validation of the questionnaires developed. For evaluation of knowledge of teachers regarding APD in Phase 2 of the study, 92 teachers from five different government primary schools in a rural set-up and five different government primary schools in an urban set-up were evaluated. Among the 92 teachers, 37 taught in the rural schools and 55 taught in the urban schools. The educational qualification of the teachers was either Diploma in Education or Bachelors in Education. Only those with a minimum experience of one year in teaching were

selected for the study. Further, only teachers who taught curricular subjects to the children they were reporting about in Phase 3 of the study were selected.

In Phase 3 of the study, 2029 primary school-going children in the age range of ≥ 7 to < 11 years were screened using SCAP. Among them, 899 studied in five different government primary schools in rural set-ups and 1130 studied in five different government primary schools in urban set-ups. The schools were randomly selected within rural and urban locations. The children were also chosen randomly from grade 2 to grade 5 in both set-ups. Further, the children were classified into four age groups. Group 1 had 461 children aged ≥ 7 to < 8 years; Group 2 consisted of 447 children aged ≥ 8 to < 9 years; Group 3 consisted of 551 children aged ≥ 9 to < 10 years; and Group 4 consisted of 570 children aged ≥ 10 to < 11 years. It was ensured that none of the children had peripheral hearing loss or history of language impairment. Children who shifted schools from a rural to urban set-up or vice versa were excluded from the study.

3.2 Test Environment

The screening of the children was done in quiet, well illuminated rooms within the premises of the schools located in urban and rural areas. The schools were categorized as urban and rural based on the definition provided by Census Bureau (2011). Using convenience sampling, five government primary schools in Mysuru urban area and five government primary schools from Gundlepet rural area were selected for the study. The rooms selected within the schools were away from major sources of noise within the school and the doors and windows were shut to reduce interference of noise. Additionally, the rooms were free from visual distractions.

3.3 Instrumentation

A calibrated Oto Read OAE analyser with facility to carry out Distortion Product Oto Acoustic Emission (DPOAE) was used to rule out peripheral hearing problem. An otoscope (Specula mini 3000) was used for visual inspection of the ear.

3.4 Material

SCAP, developed by Yathiraj and Mascarenhas in 2004 was used to screen the children for the presence of APD. It consisted of 12 questions that obtained information regarding the auditory perceptual abilities, auditory memory and other related symptoms.

Further, two questionnaires were developed as a part of the study. The first was developed to assess the knowledge of teachers regarding auditory processing disorder. The second was developed to obtain information regarding the educational background of the family and educational support given to the children.

Phase 1: *Development of questionnaires*

The questionnaire regarding *'Knowledge of school teachers regarding APD'* was designed to tap information on the following two domains: Knowledge about signs and symptoms of APD, and measures to be taken for children with signs and symptoms of APD. The questions were framed based on information available in literature as well as the knowledge of professionals working in the area of APD.

Content validity of the developed questionnaire was done using five audiologists who had experience in the area APD for at least 05 years. The audiologists were

requested to indicate whether the questions elicited information regarding knowledge of teachers about APD as well as were appropriate for the domain under which they were listed. They were also required to comment about the scores assigned to the questions. The questions and scores that were considered appropriate by 80% of the audiologists were retained and the remaining were deleted/modified. Thus, the final version of the questionnaire (Appendix 1a) consisted of 7 questions regarding the knowledge about signs and symptoms of APD (1^{st} domain) and 1question with 12 options regarding measures to be taken by teachers in case children show signs and symptoms of APD (2^{nd} domain). All questions required Yes/ No answers and every correct answer was assigned a score of 1 and 0 for every wrong answer. The maximum possible correct score was 19. The scores recommended for the different questions are provided in Appendix 1b.

The questionnaire on the *Family literacy and educational support provided to children* was designed to elicit information regarding demographic details and general information of the family (1^{st} domain). Additionally, information regarding educational background of the family (2^{nd} domain) and educational support received by a child (3^{rd} domain) was obtained. The questions under each domain were selected based on input of professionals. The initial questionnaire consisted of 4 questions along with demographic details in the 1^{st} domain, 3 questions in the 2^{nd} domain and in 3^{rd} domain, there were 2 questions with 3 subsections in first question and 1 subsection in second question.

The content validity of the developed questionnaire was established with the assistance of 5 special educators who were not involved in the initial development. They

were requested to indicate whether the domains, questions, and scoring were appropriate. Only responses that were marked as appropriate by 80% of the special educators were retained in the final questionnaire (Appendix 2a). The final questionnaire consisted of 12 questions that were designed to elicit appropriate information regarding demographic details and other general information of the family (1st domain), educational background of the family (2nd domain) and educational support given to a child (3rd domain). All questions from the initial questionnaire were retained. The 1st domain consisted of 4 questions that included demographic details and 2nd and 3rd domains encompassed of 2 questions in each domain along with subsections. The scorings for the different sections of the questionnaire are provided in Appendix 2b.

Translation of questionnaires from English to Kannada was done by a native speaker of Kannada who was fluent in both languages. Two others who were also fluent in both Kannada and English were required to carry out a reverse translation of the Kannada questions to English. The Kannada translation was considered appropriate as the reverse translation captured the essence of the information being conveyed (Appendix 1c & Appendix 2c).

3.5 Procedure

The study was conducted abiding to the guidelines provided in theEthical Guidelines for Bio-Behavioural Research Involving Human Subjects (2009) of All India Institute of Speech and Hearing. Prior to carrying out the study, permission was also taken from the Deputy Director for Public Instruction of both Mysuru and

Chamarajanagar districts for evaluating the participants. The former was in charge of Mysuru and the latter in charge of Gundlepet.

Phase 2: *Procedure for evaluation of knowledge of teachers regarding APD*

A cross sectional survey was carried out in the 5 rural primary government schools located in Chamarajanagara district and 5 urban primary government schools located in Mysuru district to assess the knowledge of teachers regarding APD. Teachers from the rural schools (N = 37) and urban schools (N = 55) were independently informed about the purpose of the study prior to administering the developed questionnaire. They were also briefed about how to answer the questionnaire. The 92 teaches who were evaluated excluded 2 teachers from an urban set-up who were unwilling to answer the questionnaire and hence were not included in the study. The teachers who participated in the study were not allowed to discuss with other teachers while answering the questions to avoid one participant biasing another.

Using the developed scoring procedure (Appendix 1b), the responses of the participants were scored. A maximum correct score of 7 and 11 were given to first and second domain respectively. For each participant, the total score was calculated and tabulated.

Phase 3: *Procedure for screening for APD and obtaining information regarding family literacy and educational support provided to children*

Prior to screening for APD, to rule out the presence of any peripheral hearing loss, 899 children studying in rural schools and 1130 children studying in urban schools were screened. A visual inspection of the ear as well as screening OAE was carried out

for all the children. The visual inspected was done using an otoscope to rule out the presence of impacted wax, foreign object in the canal and other visible anomalies that may cause hearing problem. In children who had clear ear canals, DPOAEs were recorded for four frequencies (500 Hz, 1000 Hz, 2000 Hz, & 4000 Hz) in both the ears at 65 dB peak SPL (L1) and 55 dB peak SPL (L2) with an f2:f1 ratio of 1.22 : 1. The children were labeled as 'Pass' or 'Refer' automatically by the instrument. The OAE testing was repeated in those participants who were categorised as 'refer' in order to confirm the interpretation. Those (N = 11; 7 from rural and 4 from urban setups) who continued to be categorised as 'refer' were recommended to undergo detailed evaluation at an audiological centre and were eliminated from the rest of the study.

Those who passed the visual inspection and OAE screening were screened for the presence of APD using SCAP. The school teachers who taught curricular subjects and had a minimum of one year of experience teaching the children being evaluated were instructed to answer SCAP. The same teachers were also instructed to answer the questionnaire on *Family literacy and educational support provided to children*. Prior to administration of the checklist / questionnaire, the teachers were instructed as to how they were expected to answer the tools. SCAP was scored as per the recommendations of Yathiraj and Mascarenhas (2003). The questionnaire was scored as per the scoring given in Appendix 2b.

3.6 Test-Retest Reliability:

Test-retest reliability was done for 5% (N = 100) of the children by requesting teachers to answer SCAP as well as the questionnaire '*Family literacy and educational*

support provided to children' again. Re-administration of all the above was done within a month's interval.

3.7 Analyses

The obtained data were tabulated and analysed using SPSS (version 17) and Smiths Statistical Package. Kolmogorov- Smirnov test of normality was used to check the normality of the obtained sample from children in rural and urban setups. As the scores were not normally distributed, non-parametric statistics was used. Both descriptive and inferential statistical analyses were done. Mann Whitney U test was done to determine the differences across groups of normal and at-risk children between rural and urban areas. A two-sample Z test for equality of proportions was administered by using Smiths Statistical Package to compare the number of children who were at-risk for APD between rural and urban setups. Further, a Spearman's correlation was done to find the effect literacy level of the family as well as of educational support provided to the children on SCAP scores.

Additionally, prior to analyzing the data regarding the knowledge of APD by the teachers, a Shapiro Wilk test of normality was done. As the obtained data were normally distributed, parametric statistics was used. An independent two sample t-test was used to compare the knowledge of teachers regarding APD between the rural and urban setups. A Pearson's correlation test was used to study the effect of number of years of experience of the teachers with the scores obtained by them on the questionnaire assessing their knowledge of APD.

Chapter 4

RESULTS

The data obtained from the teachers regarding children studying in rural and urban setups were analysed using SPSS (Version 17) to compare the number of children who are at-risk for APD in the two locations (urban & rural schools). The data were also analysed to find the effect of family literacy and educational support given to children on risk for APD children studying in rural and urban schools. Additionally, the data were analysed to compare the knowledge of teachers regarding APD in rural and urban schools. Initially, Kolmogorov-Smirnov test of normality was carried out to check if the data obtained regarding SCAP scores, family literacy and educational support for children at-risk for APD in the rural and urban areas were normally distributed. As the data were not normally distributed, further analyses on these data were done using non-parametric statistics. Further, Shapiro-Wilk test of normality indicated that the knowledge of teachers regarding APD was found to be normally distributed. Hence, these data were analysed using parametric statistics.

The results of the study are provided under the following sub-headings:

4.1 Comparison of number of children who are at-risk for APD across rural and urban setups (analysed using two-sample z test for equality of proportions).

4.2 Comparison of number of children who are at-risk for APD across four age groups (≥ 7 to < 8 years, ≥ 8 to < 9 years, ≥ 9 to < 10 years, & ≥ 10 to < 11 years) within rural and urban setups (analysed using two-sample Z test for equality of proportions).

4.3 Effect of family literacy / educational support received at home on SCAP scores of children in rural and urban schools (analysed using Spearman's correlation & Mann-Whitney U test).

4.4 Comparison of knowledge of APD / years of experience between teachers in rural and urban school (analysed using Independent two-sample t-test and Pearson correlation).

4.1 Comparison of number of children who are at-risk for APD across rural and urban setups

In the rural area, a total of 132 (14.68%) children out of 899 children were found to be at-risk for APD as per the SCAP scores. On the other hand, in the urban area, 113 (10%) out of 1130 children were found to be at-risk for APD. The percentage of children at-risk for APD was higher in the rural schools compared to the urban schools in all four age groups that were studied (Table 4.1). In order to compare the number of children at-risk for APD between rural and urban schools, a two-sample z test for equality of proportions was used. This was carried out by using Smiths Statistical Package software. The result of the test indicated that there was a significant difference ($z = 3.21$, $p < 0.01$, two-tailed) between the proportion of children at-risk for APD in rural and urban areas, with it being larger in the children studying in rural set-up.

4.2 Comparison of number of children who are at-risk for APD across the age groups within rural and urban setups

The number and percentage of children at-risk for APD in each of the age groups (≥ 7 to < 8 years, ≥ 8 to < 9 years, ≥ 9 to < 10 years, & ≥ 10 to < 11 years) is provided in

Table 4.1. This is provided separately for the children studying in rural schools and children studying in urban schools. From the table it can be seen that in the rural schools, the percentage of children at-risk for APD was highest in the youngest age group, while the percentage was similar in the older three age groups. However, in the urban schools younger two age groups had a higher percentage of children at-risk for APD compared to the older two age groups.

In order to determine whether there was a statistical significant difference between the four age groups in each of educational locations, two-sample z test for equality of proportions was used (Table 4.2). No significant difference was observed across the four age groups of children studying in rural schools. On the other hand, significant differences were seen among age groups studying in the urban schools. The proportion of children at-risk for APD in the oldest age group (≥ 10 to < 11 years) was found to be significantly different from the younger two age groups (≥ 7 to < 8 years as well as ≥ 8 to < 9 years).

Table 4.1
Percentage of children who are at-risk for APD in rural and urban schools.

Age groups	Rural schools			Urban schools		
	Total number of children	Number of children at-risk for APD	Percentage of children at-risk for APD	Total number of children	Number of children at-risk for APD	Percentage of children at-risk for APD
≥ 7 to < 8 years	42	233	18.02%	27	228	11.84%
≥ 8 to < 9 years	24	193	12.43%	32	254	12.59%
≥ 9 to < 10 years	35	236	14.83%	31	315	9.84%
≥ 10 to < 11 years	31	237	13.08%	23	333	6.90%

Table 4.2
Comparison of number of children who are at-risk for APD across age range in rural and urban schools.

Comparison groups	Rural		Urban	
	/z/ Value	*p* Value	/z/ Value	*p* Value
≥ 7 to < 8 years and ≥ 8 to < 9 years	1.58	> 0.05	0.25	> 0.05
≥ 7 to < 8 years and ≥ 9 to < 10 years	0.93	> 0.05	0.74	> 0.05
≥ 7 to < 8 years and ≥ 10 to < 11 years	1.48	> 0.05	2.01	**< 0.05**
≥ 8 to < 9 years and ≥ 9 to < 10 years	0.71	> 0.05	1.04	> 0.05
≥ 8 to < 9 years and ≥ 10 to < 11 years	0.20	> 0.05	2.34	**< 0.05**
≥ 9 to < 10 years and ≥ 10 to < 11 years	0.54	> 0.05	1.35	> 0.05

4.3 Effect of family literacy / educational support received by the children and SCAP scores of the children within rural and urban schools

Table 4.3 provides the mean, standard deviation and median of the SCAP scores, family literacy and educational support for children studying in rural and urban schools. From the Table 4.3 it can be observed that the SCAP scores and educational support provided to children was higher in rural schools than urban schools. However, family literacy was found to be similar across rural and urban schools in children who were referred on SCAP but in children who were pass on SCAP, family literacy was observed to be high in rural than in urban schools.

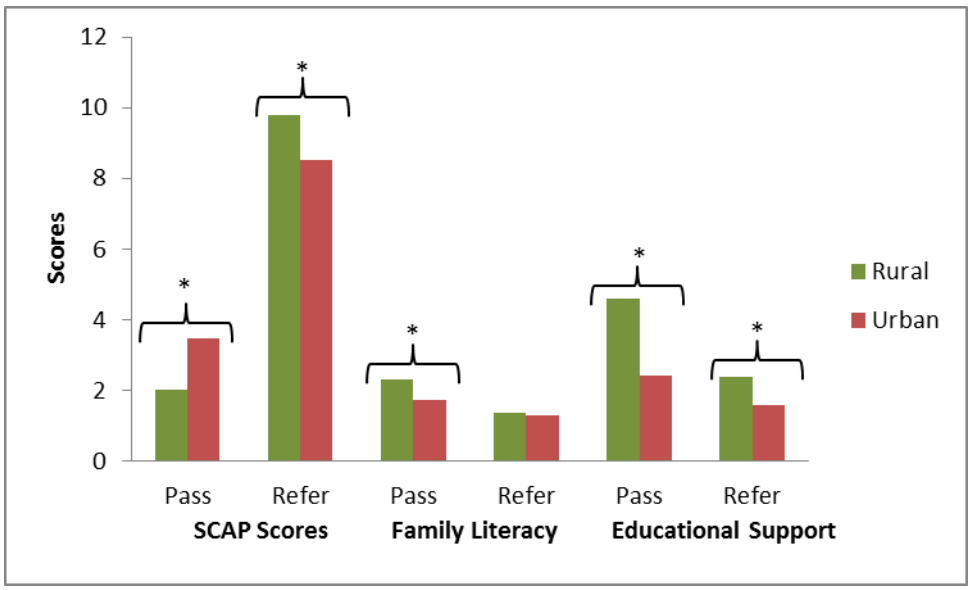
Table 4.3
Mean, Standard Deviation (SD) and Median for SCAP scores, Family literacy (lit) and Educational Support (Ed Supp) in rural and urban setups for children who pass and are referred on SCAP.

Location		**Rural**			**Urban**			**Total (rural + urban)**		
		SCAP Scores	**Family Lit**	**Ed Supp**	**SCAP Scores**	**Family Lit**	**Ed Supp**	**SCAP Scores**	**Family Lit**	**Ed Supp**
Pass SCAP	Mean	2.02	2.03	4.61	3.48	1.74	2.40	2.67	1.90	3.62
	SD	1.79	0.93	1.79	1.53	0.92	1.72	1.83	0.92	2.07
	Median	2.00	2.00	5.00	4.00	1.50	2.50	3.00	2.00	4.50
Referred on SCAP	Mean	9.80	1.35	2.41	8.53	1.29	1.57	9.22	1.32	2.02
	SD	1.75	0.86	2.11	1.89	0.99	1.98	1.92	0.92	2.09
	Median	10.00	1.00	3.00	8.00	1.00	0.75	9.00	1.00	1.00
Total (pass + refer)	Mean	5.87	1.70	3.52	6.04	1.52	1.99	5.94	1.62	2.83
	SD	4.28	0.95	2.24	3.07	0.98	1.90	3.77	0.97	2.23
	Median	5.00	1.50	4.50	6.00	1.50	1.50	5.50	1.50	3.00

Note. Maximum SCAP score = 12
Maximum Family Literacy score = 18
Maximum Educational Support score = 10

The relation between family literacy / educational support given to the children at home on SCAP scores of the children, Spearman's correlation was used. This was carried out separately for the children in the rural schools, urban schools as well as for the merged data (rural + urban). The results of the Spearman's correlation showed a significant but moderate negative correlation between the *family literacy* and SCAP scores of the children studying rural school (r = -0.46, $p < 0.0001$). However, for children studying in urban schools this significant negative correlation was weak (r = -0.31, $p < 0.0001$). When the data of the rural and urban schools were merged, the significant negative correlation was found to be moderate (r = -0.40, $p < 0.0001$). Similarly, *educational support* given to the children also had a significant moderate negative correlation for the children studying in rural schools (r = -0.56, $p < 0.0001$), weak for children studying in urban schools (r = -0.24, $p < 0.0001$), and moderate when the data of rural and urban schools were merged (r = -0.42, $p < 0.0001$).

The significance of difference between family literacy / educational support received by children across rural and urban schools was evaluated using Mann-Whitney U test. Among children who passed SCAP, a significant difference was present regarding family literacy (/z/ = -3.01, $p < 0.0001$) and educational support received (/z/ = -9.12, $p < 0.0001$) across in rural and urban schools. However, in children who were at-risk for APD, significant difference was seen only in educational support (/z/ = -3.02, $p < 0.0001$) but not in family literacy (/z/ = -0.88, $p > 0.05$) across urban and rural schools (Figure 4.1).



Note. * = $p < 0.05$; Maximum SCAP score = 12; Maximum Family Literacy score = 18; Maximum Educational Support score = 10

Figure 4.1. Mean scores of SCAP, family literacy and educational support across the children who were pass and refer on SCAP in rural and urban schools.

4.4 Comparison of knowledge of APD / years of experience between teachers in rural and urban schools

The knowledge of teachers regarding APD was compared across rural and urban schools (Table 4.4). From the Table 4.4 it can be noted that teachers in rural schools obtained higher scores regarding knowledge of APD than teachers from urban schools. Further, to check if there was a significant difference, an independent t-test was done. The results indicated the presence of a significant difference ($t = 2.89$, df = 85; $p < 0.05$) in the knowledge of APD between teachers in rural and urban schools. The knowledge was higher in teachers in rural schools compared to those in urban schools.

Table 4.4
Mean, Standard Deviation (SD) and Range of years of experience of the teachers and their scores on knowledge of APD in rural and urban schools.

School location	Teacher related parameters	Range	Mean	SD
Rural	Years of experience	1.00 to 32.00	13.05	7.54
	Scores on knowledge of APD	5.00 to17.00	13.40	2.03
Urban	Years of experience	1.00 to34.00	21.90	7.17
	Scores on knowledge of APD	3.00 to 17.00	11.49	3.34

Note. Maximum score = 19

The years of experience in teaching varied in teachers teaching in rural schools with the teachers in the rural schools having lesser experience compared to urban schools (Table 4.4). To determine the relation between the experience of teachers on their knowledge of APD, Pearson correlation was carried out. The test was done separately for teachers from rural and urban schools. In rural school teachers, a significant negative moderate correlation (r = -0.39, $p < 0.01$, 2-tailed) was obtained between their experience and their knowledge of APD. On the other hand, among urban teachers, no significant correlation ($r = 0.02$, $p > 0.89$, 2-tailed) was seen.

Test-Retest Reliability:

Cronbach's alpha was calculated to determine the test-retest reliability of the SCAP scores, family literacy and educational support for children across rural and urban areas. The alpha coefficient was found to be greater than 0.95 for all parameters, indicating that the responses obtained from the teachers was reliable.

From the findings of the study it can be noted that a significantly higher number of children were at-risk for APD in rural schools compared to urban schools. There was no significant difference noticed across the age groups in rural schools. However, in urban schools, the number of children at-risk for APD was significantly less in those aged ≥ 10 to < 11 years compared to the younger two age groups (≥ 7 to < 8 years & ≥ 8 to < 9 years). Further, a significant negative correlation was seen between family literacy / educational support and SCAP scores in both rural and urban setups. The correlation was moderate for the rural schools, but weak in the urban schools. Similarly, a significant difference was observed in educational support and family literacy for children not at-risk for APD in rural and urban setups, with it being more in rural schools. However, in children who were at-risk for APD, a significant difference was seen only in educational support but not in family literacy in rural and urban schools. Additionally, the teachers from rural schools had a significant higher knowledge of APD compared to teachers from urban schools. Also, a significant negative moderate correlation was found between the experience of teachers and their knowledge of APD in rural schools, whereas no such correlation was seen in urban schools.

Chapter 5

DISCUSSION

The results of the study have been discussed in terms of the number of children at-risk for APD across rural and urban schools; effect of family literacy and educational support provided to children out of school on symptoms of APD; and knowledge of APD by teachers across rural and urban schools.

5.1 Comparison of the number of children at-risk for APD across rural and urban schools

The current study revealed that more children are at-risk for APD in rural schools (14.68%) than in urban school (10%). This difference between children in urban and rural schools was found to be statistically significant.

The trend of more children being at-risk for APD in the rural schools compared to the urban schools is in line with the dropout rate seen in rural and urban schools. Studies carried out in India indicate that there are more school dropouts in rural areas than in urban areas (Gouda & Sekher, 2014; Sarva Shiksha Abhiyan, 2013). Researchers have found poor academic performance or repeated failures to be major causes for school dropout (Chigari et al., 2015; Gouda & Sekher, 2014; Govindaraju & Venkatesan, 2010; Minz et al., 2015; National Sample Survey Organisation, 2014; Patil & Malagi, 2013; Pratinidhi et al., 1992; Sarva Shiksha Abhiyan, 2013). It has also been established that children with symptoms of APD have difficulties poor academic performance including poor reading skills (Bellis & Ferre, 1999; Cacace & McFarland, 1998; Jerger & Musick, 2000; Rosen et al., 2010; Sharma et al., 2009; Wit et al., 2016).

Thus, it can be speculated that there may be a link between the presence of APD and poor academic performance / school dropouts.

The current study indicates that in urban schools there are a larger number of children at-risk for APD in lower classes compared to the higher classes. This age related difference in the number of children who are at-risk for APD, seen in the urban schools, probably occurred as a larger number of children in lower classes dropout of school, thus resulting in a lesser number of them being at-risk for APD in the higher classes. Evidence of a larger drop rate in lower classes was also observed in a study by Patil and Malagi (2013) in Bijapur district of Karnataka. They reported that the majority of children dropout from school before reaching their grade 5. Hence, it is possible there exists a link between the number of children who are at-risk for APD and their academic difficulty, resulting in them discontinuing school in urban schools.

In the present study, no age effect was observed in children studying in rural schools. This indicates that the number of children who are at-risk for APD are similar across the classes. While interviewing the teaches during data collection of the study, it was observed that the teachers from the rural schools showed more concern regarding the performance of the children and provide more individual attention. They were probably able to so due to the lesser strength of children per class compared to urban schools. Thus, although a large number of children in the rural schools were at-risk for APD, due to the dedication of the teachers, they continued to study and not dropout. This was unlike what happened in the urban schools.

5.2 Family literacy and educational support provided at home for children

In the present study, a significant negative correlation was noted between family literacy / educational support given to children and the SCAP scores of the children. This negative correlation was found to be moderate in rural schools and weak in urban schools. Thus, it can be inferred that as the educational support given to the children increased, their symptoms of APD reduced, resulting in lower scores on SCAP. This indicates that if the family literacy and the support given to the children were higher, the symptoms of APD were less. However, family literacy in rural and urban schools (Table 4.3) was noted to be similar, suggesting that it could not be the reason for the difference in relation between SCAP scores and family literacy in these two educational locations. However, a marked difference existed between the educational support given in the rural and urban schools, with it being more in the former. Hence, it is speculated that the support given to the children had a greater impact on the SCAP scores rather than the family literacy and this resulted in the difference between the children in urban and rural schools.

Further, in present study, educational support and family literacy were found to be significantly more for children studying in rural government schools than in urban government school for children not at-risk for APD. However, in children who were at-risk for APD, this significant difference was seen only for educational support but not for family literacy across rural and urban schools. The family literacy was found to be low in all children, irrespective of whether they passed or were referred as well as studied in rural or urban government schools. Further, the quantum of educational support was higher in the rural areas compared to the urban areas. It is possible that the

caregivers of the children studying in rural government schools, after a day's work, spent time with the family. On the other hand, caregivers of children studying in urban government schools who were usually migrants from rural areas (as reported by the teachers in urban schools), probably chose alternative options to spend their time, resulting in them spending less time in providing support to their wards.

5.3 Knowledge of APD / years of experience in teachers across rural and urban schools

The results of the present study indicated that the teachers in rural schools had significantly better knowledge of APD than teachers in urban schools. In addition, a significant negative moderate correlation was found between experience of the teachers and their knowledge regarding APD in rural schools, whereas no such significant correlation was seen in urban schools.

The teachers in the rural schools probably had more knowledge of APD due to frequent orientations programs and workshops organised by non-governmental organizations with the aim to improve the quality of education in rural areas. Such training programs that teachers and children reported of in the rural schools were not mentioned by the teachers in the urban schools. This could have been one of the reasons resulting in a difference between the knowledge of teachers in rural and urban schools.

The experience of the teachers in teaching was found to have a negative correlation with their knowledge of APD in rural government schools but not in urban government schools. Contrary to the general expectation, that teachers with longer experience should have more knowledge, the current study found that those with a

shorter experience had more knowledge. The difference in quality of training imparted to teachers over the years could have resulted in those teachers who were trained more recently to have more knowledge of APD. As can been seen in Table 4.4, the teachers in the rural schools had lesser experience compared to urban schools. Thus, it can be construed that the teachers in the rural schools, who were educated more recently, had more training regarding academic difficulties of children and ways to solve these problems than teachers in urban schools. Further, the younger generation of teachers would have had an added advantage of being more computer literate and hence would have had access of information available in the internet regarding training difficult-to-educate children. Further, it was observed while interviewing the teachers, that those in the rural government schools were more dedicated and cooperative that their counterparts in the rural government schools. These reasons could have led to the teachers with lesser experience having more knowledge about APD.

Thus, from the findings of the current study regarding children at-risk for APD in rural and urban schools, it can be speculated that APD may be one of the causes that leads to a larger number of school-dropouts. Further, it was noted that the higher grades of children studying in urban schools had fewer children at-risk for APD, probably because those with poor academic performance would have dropped out from the school in the lower grades. On the other hand, in rural schools, no difference in number of children at-risk for APD was seen across grades due to the individual attention and help given by the teachers to enable the children to continue with their studies. Additionally, family literacy and educational support was found to be correlated with SCAP scores of the children, with educational support being considered to be a more important factor

than family literacy. Further, the teachers from rural schools had more knowledge of APD than urban schools, probably due to frequent orientation programs and workshops conducted for them, and due to the quality in their teacher training programs.

Chapter 6

SUMMARY AND CONCLUSIONS

Auditory processing disorder (APD) has been speculated to cause reading and learning difficulties that results in poor scholastic performance (Bellis, 1996; Bellis & Ferre, 1999; Cacace & McFarland, 1998; Dawes & Bishop, 2007; Katz, 1994; Rosen et al., 2010; Sharma et al., 2009; Wit et al., 2016). Further, several studies have reported of poor academic performance as being a major factor leading to school dropouts (Govindaraju & Venkatesan, 2010; Minz et al., 2015; Patil & Malagi, 2013; Pratinidhi et al., 1992). In India, it has been noted that the dropout rate from schools is more in rural schools compared to urban schools (Gouda & Sekher, 2014; National Sample Survey Organisation, 2014; Sarva Shiksha Abhiyan, 2013; Sarva Shikshana Abhiyan Karnataka, 2010). It needs to be determined if there exists a similar trend in the presence of children who are at-risk for APD in rural and urban schools. It also needs to be established whether family literacy level and educational support have any relation with those who are or who are not at-risk for APD.

The primary aim of the study was to compare the number of children at-risk for APD between rural and urban government schools. Further, the effect of family literacy / educational support received at home on SCAP scores of children in rural and urban government schools was studied. A comparison of knowledge teachers regarding APD / years of experience in teachers across rural and urban government schools was also studied. The study was carried out in three stages. The first stage involved the development of questionnaires to assess the knowledge of school-teachers regarding APD and to collect information about the family literacy and educational support

provided to children at home. The second stage included the assessment of knowledge of APD in 37 teachers from rural government schools and 55 teachers from urban government schools. In the third stage, 2029 children from different government primary schools in rural (N = 899) and urban (N = 1130) schools were screened using SCAP. In addition, information regarding family literacy and educational support provided to the children were obtained from the teachers in the third phase.

The findings of the current study revealed that the children at-risk for APD were found to be significantly high in rural government schools than in urban government schools. No such significant difference in number of children at-risk for APD was noted across the age groups (≥ 7 to < 8 years, ≥ 8 to < 9 years, ≥ 9 to < 10 years, & ≥ 10 to < 11 years) in rural government schools. However, in urban government schools, children in the age range of ≥ 10 to < 11 years were observed to have significantly less number of children at-risk for APD as compared with the children in the age range of ≥ 7 to < 8 years and ≥ 8 to < 9 years. Further, a significant negative moderate correlation was found between family literacy / educational support and SCAP scores in rural government schools whereas in urban government schools this correlation was found to be weak. Additionally, in children who were not at-risk for APD, family literacy and educational support were noticed to be high in rural areas when compared to urban areas. However, in children at-risk for APD, only educational support was high in rural areas, but the family literacy was found to be similar across rural and urban areas.

Further, the knowledge of APD in teachers was observed to be more in teachers from rural government schools than in teacher from urban government schools. A significant negative moderate correlation was noted between the years of experience

and their knowledge regarding APD in rural schools, whereas no correlation was seen in urban schools.

Thus, it can be concluded from the findings of the study that a larger number of children are at-risk for APD in rural government schools than in urban government schools. Family literacy and educational support provided to the children at home may also influence the presence of symptoms of APD in children. Thus, it is speculated that the presence of symptoms of APD may be one of the factors that results in children having poor academic performance leading them to drop out of school. It needs to be further evaluated whether symptoms of APD influence the educational outcome of children in schools.

Implications of the study

1. The study provides information about the difference in number of children at-risk for APD across rural and urban schools.
2. This information sheds light on the target group that requires more facilities to diagnose the presence of APD and support to cope with the condition.
3. The results obtained from the study can be used to make recommendations to the government to set-up different APD based programs in the location that has a larger number of children at-risk for APD.
4. The current study establishes a possible link between school dropouts and APD.
5. The study leads to a better understanding of the effect of family literacy and educational support provided to children on SCAP scores.

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APPENDIX

APPENDIX 1a

Knowledge of teachers regarding APD

Name:

Name of the school:

Experience as teacher (in years):

Subject taught:

Education:

Sl. No.	QUESTIONS	YES	NO
1.	Do you think that children are not able to understand speech though they might have normal hearing?		
2.	Can children face difficulty in understanding speech in the presence of noise? (Eg. When other children talk in the class)		
3.	Is it possible for children to hear what you say but keep asking for frequent repetition of instructions in class?		
4.	Do you think that some children lose interest in what you teach very fast compared to most children?		
5.	Can children who study very hard have poor academic performance?		
6.	Do think that children can have difficulty in following the commands given one after the other? (Take your science book. Open page 10. Answer the questions given)		
7.	Do you think that all children who perform poorly in school have mental retardation?		
8.	If you find a child with normal hearing but with poor school performance , will you: *(tick as many choices as possible)*		
	a. Ignore the child as he/she is pretending to have a problem.		
	b. Scold the child as he/she is pretending to have a problem.		
	c. Ask the help of other teachers who have seen similar children.		

	d. Ask the child's parents to admit the child in a special school.		
	e. Refer the child to a special educator.		
	f. Refer the child to an ENT specialist.		
	g. Ask other children to help the child.		
	h. Try to help the child yourself.		
	i. Ask the child's parents to admit the child in another similar school.		
	j. Tell the parents that such children cannot be taught.		
	k. Refer the child to a speech and hearing professional.		
	l. Refer the child to general physician (doctor).		

Signature

APPENDIX 1b

Scoring Key for questionnaire *'Knowledge of teachers regarding APD'*

Sl. No.	QUESTIONS	YES	NO
1.	Do you think that children are not able to understand speech though they might have normal hearing?	1	0
2.	Can children face difficulty in understanding speech in the presence of noise? (Eg. When other children talk in the class)	1	0
3.	Is it possible for children to hear what you say but keep asking for frequent repetition of instructions in class?	1	0
4.	Do you think that some children lose interest in what you teach very fast compared to most children?	1	0
5.	Can children who study very hard have poor academic performance?	1	0
6.	Do think that children can have difficulty in following the commands given one after the other? (Take your science book. Open page 10. Answer the questions given)	1	0
7.	Do you think that all children who perform poorly in school have mental retardation?	0	1
8.	If you find a child with normal hearing but with poor school performance , will you: *(tick as many choices as possible)*		
	a. Ignore the child as he/she is pretending to have a problem.	0	1
	b. Scold the child as he/she is pretending to have a problem.	0	1
	c. Ask the help of other teachers who have seen similar children.	1	0
	d. Ask the child's parents to admit the child in a special school.	0	1
	e. Refer the child to a special educator.	1	0
	f. Refer the child to an ENT specialist.	0	1
	g. Ask other children to help the child.	1	0
	h. Try to help the child yourself.	1	0
	i. Ask the child's parents to admit the child in another similar school.	0	1
	j. Tell the parents that such children cannot be taught.	0	1
	k. Refer the child to a speech and hearing professional.	1	0

	l. Refer the child to general physician (doctor).	0	1

Domain Scoring

DOMAIN	QUESTION NO.	SCORING		
		YES	NO	TOTAL
Knowledge about signs and symptoms	1 to 7	/06	/01	/07
Measures to be taken in case children show APD symptoms	8	/05	/07	/12
TOTAL		/11	/08	/19

APPENDIX 1c

ಎ.ಪಿ.ಡಿ ಬಗ್ಗೆ ಶಿಕ್ಷಕರ ಜ್ಞಾನ

ಹೆಸರು:

ಶಾಲೆಯ ಹೆಸರು:

ಕಲಿಸುವ ವಿಷಯ:

ವಿದ್ಯಾರ್ಹತೆ:

ಶಿಕ್ಷಕ ವೃತ್ತಿಯಲ್ಲಿ ಅನುಭವ (ವರ್ಷಗಳಲ್ಲಿ):

ಕ್ರ.ಸಂ	ಪ್ರಶ್ನೆಗಳು	ಹೌದು	ಇಲ್ಲ
೦೧.	ಮಕ್ಕಳಿಗೆ ಶ್ರವಣ ಶಕ್ತಿ ಚೆನ್ನಾಗಿಯೇ ಇದ್ದರೂ, ಮಾತು ಅರ್ಥವಾಗದ ಸಾಧ್ಯತೆ ಇದೆಯೇ?		
೦೨.	ಮಕ್ಕಳಿಗೆ ಸುತ್ತ ಮುತ್ತ ಶಬ್ದ ಇರುವಾಗ ಮಾತನ್ನು ಅರ್ಥ ಮಾಡಿಕೊಳ್ಳಲು ತೊಂದರೆ ಎನ್ನಿಸಬಹುದೇ? (ಉದಾ:ಇತರೆ ಮಕ್ಕಳು ಮಾತನಾಡುತ್ತಿರುವಾಗ).		
೦೩.	ಮಕ್ಕಳಿಗೆ ನೀವು ಹೇಳಿದ ಸೂಚನೆಗಳು ಕೇಳಿಸಿದ್ದರೂ, ಅವರು ಪುನಃ ಪುನರಾವರ್ತನೆಗಾಗಿ ಕೇಳುವ ಸಾಧ್ಯತೆ ಇರಬಹುದೇ?		
೦೪.	ನಿಮಗೆ ನೀವು ಪಾಠ ಮಾಡುವಾಗ, ಕೆಲವು ಮಕ್ಕಳು ಬೇರೆ ಮಕ್ಕಳಿಗಿಂತ ತುಂಬಾ ಬೇಗ ತಮ್ಮ ಆಸಕ್ತಿಯನ್ನು ಕಳೆದುಕೊಳ್ಳುತ್ತಾರೆ ಎಂದು ಅನ್ನಿಸುತ್ತದೆಯೇ?		
೦೫.	ತುಂಬಾ ಶ್ರಮಪಟ್ಟು ಓದುವ ಮಕ್ಕಳು ಕಳಪೆ ಶೈಕ್ಷಣಿಕ ಸಾಧನೆಯನ್ನು ಹೊಂದಿರಬಹುದೇ?		
೦೬.	ಮಕ್ಕಳಿಗೆ ಒಂದಾದ ಮೇಲೊಂದು ಆಜ್ಞೆಗಳನ್ನು ನೀಡಿದ್ದಲ್ಲಿ ಪಾಲಿಸಲು ಕಷ್ಟವಾಗುವ ಸಾಧ್ಯತೆ ಇದೆಯೇ? (ಉದಾ: ನಿಮ್ಮ ವಿಜ್ಞಾಣ ಪುಸ್ತಕ ತೆಗೆದುಕೊಳ್ಳಿ. ಆನಂತರ ಅದರಲ್ಲಿ ೧೦ನೇ ಪುಟ ತೆಗೆದು, ಅಲ್ಲಿರುವ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿ).		
೦೭.	ಕಳಪೆ ಶೈಕ್ಷಣಿಕ ಸಾಧನೆ ಹೊಂದಿರುವ ಮಕ್ಕಳಿಗೆ ಬುದ್ಧಿ ಮಾಂದ್ಯತೆ		

	ಇರಬಹುದು ಎಂದು ನಿಮಗೆ ಅನ್ನಿಸುತ್ತದೆಯೇ?		
೦೮.	ಮಗುವಿನ ಶ್ರವಣ ಶಕ್ತಿ ಚೆನ್ನಾಗಿ ಇದ್ದು, ಮಗು ಕಳಪೆ ಶೈಕ್ಷಣಿಕ ಸಾಧನೆ ಹೊಂದಿದ್ದಲ್ಲಿ, ನಿಮ್ಮ ಇರಾದೆ; (ಸಾಧ್ಯವಾದಷ್ಟು ಆಯ್ಕೆಗಳನ್ನು ಗುರುತಿಸಿ/ ಟಿಕ್ ಮಾಡಿ)		
	ಮಗುವನ್ನು ಇ.ಎನ್.ಟಿ ತಜ್ಞರ ಬಳಿಗೆ ಶಿಫ಼ಾರಸ್ಸು ಮಾಡುವುದು.		
	ಮಗು ಸಮಸ್ಯೆ ಇರುವಂತೆ ನಟಿಸುತ್ತಿದೆ ಎಂದು ಭಾವಿಸಿ ಮಗುವನ್ನು ನಿಂದಿಸುವುದು.		
	ಮಗುವನ್ನು ಬೇರೆ ಶಾಲೆಗೆ ಸೇರಿಸುವಂತೆ ಪೋಷಕರಲ್ಲಿ ಮನವಿ.		
	ಮಗುವನ್ನು ಸಾಮಾನ್ಯ ವೈದ್ಯರ ಬಳಿಗೆ ಶಿಫ಼ಾರಸ್ಸು ಮಾಡುವುದು.		
	ಇಂತಹ ಮಕ್ಕಳಿಗೆ ಕಲಿಸಲಾಗುವುದಿಲ್ಲ ಎಂದು ಪೋಷಕರಿಗೆ ತಿಳಿಸುವುದು.		
	ಮಗು ಸಮಸ್ಯೆ ಇರುವಂತೆ ನಟಿಸುತ್ತಿದೆ ಎಂದು ನಿರ್ಲಕ್ಷಿಸುವುದು.		
	ವಿಶೇಷ ಶಾಲೆಯಲ್ಲಿ ಮಗುವಿನ ಪ್ರವೇಶಕ್ಕಾಗಿ ಪೋಷಕರಿಗೆ ಸೂಚನೆ.		
	ಮಗುವಿಗೆ ಸಹಾಯ ಮಾದಲು ಯತ್ನ.		
	ಮಗುವನ್ನು ಅರಿತಿರುವ ಇತರೇ ಶಿಕ್ಷಕರ ಸಹಾಯಕ್ಕಾಗಿ ಕೋರಿಕೆ.		
	ವಿಶೇಷ ಶಿಕ್ಷಣಶಾಸ್ತ್ರಜ್ಞ/ ಶಿಕ್ಷಕರ ಬಳಿಗೆ ಶಿಫ಼ಾರಸ್ಸು ಮಾಡುವುದು .		
	ವಾಕ್ ಶ್ರವಣ ತಜ್ಞರ ಬಳಿಗೆ ಶಿಫ಼ಾರಸ್ಸು ಮಾಡುವುದು .		
	ಇತರೆ ಮಕ್ಕಳಿಗೆ ಈ ಮಗುವಿನ ಸಹಾಯ ಮಾಡಲು ಕೋರಿಕೆ.		

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APPENDIX 2a

Family Literacy and Educational Support Provided to Children

1. Name of the student:
2. Age / gender:
3. Class:
4. School:
5. Parents details:

	Education	Occupation
Father	Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.	
Mother	Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.	

6. Family income per annum: Less than 30,000 □; 30,000 - One lakh □; Greater than one lakh □.
7. Sibling details:

Sl No.	Age	Education
1.		Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.
2.		Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.
3.		Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.
4.		Illiterate □; Primary schooling □; Secondary schooling □; PUC □; Graduate □; Post Graduate □; PhD □.

8. How many years has the child studied in the current school?

Less than a year □; 1 year □; 2 years □; 3 years □; 4 years □; 5 years □.

9. Does the child attend tuitions?

   a. If yes, for how long?

   Less than a year □; 1 year □; 2 years □; 3 years □; 4 years □; 5 years □; Greater than 5 years □; Do not know □.

10. Is the child helped at home in studying?

   a. If yes, who helps the child study at home?

   Father □; Mother □; Siblings □; If others, mention who: _____

   b. Is the child helped every day □; 6 times a week □; 5 times a week □;

   4 times a week □; Monthly once □; Only during exams □;

   If less than 4 times a week, mention how frequently _____

   c. How much time they spend to teach the child each time?

   Less than an hour □; 1-2 hours □; 2-3 hours □; Greater than 3 hours □.

11. Has the child failed in any earlier exams?

   a. If yes, mention the number of failures:

   Once □; Twice □; More than twice □.

12. Is there any person in the house with disability?

   a. If yes, mention the disability:

   Blindness □; Hearing impairment □; Speech problem □;

   Mental retardation □; Cerebral palsy □; Orthopaedic disability □;

   Multiple disabilities□; If others, mention the disability: _____

   b. The relation of the person with disability to the child _____

APPENDIX 2b

Scoring Key for questionnaire '*Family Literacy and Educational Support Provided to Children'*

Domains	Question No.	Sections	Score
General information	11	1. Number of failures	
		Once	-0.5
		Twice	-1
		More than twice	-1.5
	12	2. Person with disability in house	-1
Family Literacy	5 & 7	Illiterate	0
		Primary schooling	.5
		Secondary schooling	1
		PUC	1.5
		Graduate	2
		Post Graduate	2.5
		Ph. D	3
Educational Support	10	1. Frequency of the help	
		Only during exams	0.25
		Monthly once	.5
		Weekly once	1
		Twice a week	1.5
		Three times a week	2
		Four times a week	2.5
		Five times a week	3
		Six times a week	3.5
		Every day	4
		2. Duration of the help	
		Less than one hour	0.5
		One hour	1
		Two hours	1.5
		Three hours	2
		More than three hours	2.5
	9	3. Private tuitions (Duration)	
		Less than a year	0.5
		One year	1
		Two years	1.5
		Three years	2
		Four years	2.5
		Five years	3
		More than five years	3.5

APPENDIX 2c

ಕುಟುಂಬ ಸಾಕ್ಷರತೆ ಮತ್ತು ಮಕ್ಕಳಿಗೆ ಒದಗಿಸುವ ಶೈಕ್ಷಣಿಕ ಬೆಂಬಲ

೦೧. ವಿದ್ಯಾರ್ಥಿಯ ಹೆಸರು:

೦೨. ವಯಸ್ಸು/ಲಿಂಗ:

೦೩. ತರಗತಿ:

೦೪. ಶಾಲೆಯ ಹೆಸರು:

೦೫. ಪೋಷಕರ ವಿವರಗಳು:

	ವಿದ್ಯಾಭ್ಯಾಸ	ವೃತ್ತಿ
ತಂದೆ	ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.	
ತಾಯಿ	ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.	

೦೬. ಕುಟುಂಬದ ವಾರ್ಷಿಕ ಆದಾಯ: ೫೦,೦೦೦ಕ್ಕಿಂತ ಕಡಿಮೆ □; ೫೦,೦೦೦ - ೧,೦೦,೦೦೦ □; ಒಂದು ಲಕ್ಷಕ್ಕಿಂತ ಹೆಚ್ಚು □.

೦೭. ಒಡಹುಟ್ಟಿದವರ ವಿವರಗಳು:

ಕ್ರ.ಸಂ	ವಯಸ್ಸು	ವಿದ್ಯಾಭ್ಯಾಸ
೦೧.		ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.
೦೨.		ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.
೦೩.		ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.

೦೪.		ಅನಕ್ಷರಸ್ಥ □; ಪ್ರಾಥಮಿಕ ಶಾಲಾ ಶಿಕ್ಷಣ □; ಪ್ರೌಢ ಶಿಕ್ಷಣ □; ಪಿ ಯು ಸಿ □; ಪದವಿಧರ □; ಸ್ನಾತಕೋತ್ತರ ಪದವಿಧರ □; ಪಿ ಹೆಚ್ ಡಿ □.

೦೮. ಮಗು ಪ್ರಸ್ತುತ ಶಾಲೆಯಲ್ಲಿ ಎಷ್ಟು ವರ್ಷದಿಂದ ವಿದ್ಯಾಭ್ಯಾಸ ಮಾಡುತ್ತಿದ್ದಾನೆ/ಳೆ?

ಒಂದು ವರ್ಷಕ್ಕು ಕಡಿಮೆ □; ಒಂದು ವರ್ಷ □; ಎರಡು ವರ್ಷ □; ಮೂರು ವರ್ಷ □;

ನಾಲ್ಕು ವರ್ಷ □; ಐದು ವರ್ಷ □.

೦೯. ಮಗು ಮನೆ ಪಾಠಕ್ಕೆ ಹೋಗುತ್ತಿದ್ದಾನೆಯೇ? ಹೌದು □; ಇಲ್ಲ □.

ಹೋಗುತ್ತಿದ್ದಲ್ಲಿ, ಯಾವಾಗಿನಿಂದ?

ಒಂದು ವರ್ಷಕ್ಕು ಕಡಿಮೆ □; ಒಂದು ವರ್ಷ □; ಎರಡು ವರ್ಷ □; ಮೂರು ವರ್ಷ □;

ನಾಲ್ಕು ವರ್ಷ □; ಐದು ವರ್ಷ □; ಐದು ವರ್ಷಕ್ಕಿಂತಲೂ ಹೆಚ್ಚು □.

೧೦. ಮಗುವಿಗೆ ಮನೆಯಲ್ಲಿ ಓದಲು ಸಹಾಯ ಮಾಡುತ್ತಾರೆಯೇ? ಹೌದು □; ಇಲ್ಲ □.

ಅ. ಮಾಡಿದಲ್ಲಿ, ಯಾರು ಸಹಾಯ ಮಾಡುತ್ತಾರೆ?

ತಂದೆ □; ತಾಯಿ □; ಒಡಹುಟ್ಟಿದವರು □; ಬೇರೆಯವರಾದಲ್ಲಿ, ಯಾರು?_____

ಆ. ಮಗುವಿಗೆ ಪ್ರತಿದಿನ ಸಹಾಯ ಮಾಡುತ್ತಾರೆಯೇ? □; ಅಥವಾ ವಾರದಲ್ಲಿ ೬ ಬಾರಿ □;

ವಾರದಲ್ಲಿ ೫ ಬಾರಿ □; ವಾರದಲ್ಲಿ ೪ ಬಾರಿ □; ತಿಂಗಳಿಗೊಮ್ಮೆ □;

ಪರೀಕ್ಷೆ ಇರುವಾಗ ಮಾತ್ರ ಮಾಡುತ್ತಾರೆಯೇ □; ೪ ಬಾರಿಗಿಂತ ಕಡಿಮೆ ಇದ್ದಲ್ಲಿ, ಎಷ್ಟು ಬಾರಿ ಹೇಳಿಕೊಡುತ್ತಾರೆ? _____

ಇ. ಪ್ರತಿ ಬಾರಿಯು ಎಷ್ಟು ಸಮಯ ಮಗುವಿಗೆ ಕಲಿಸುತ್ತಾರೆ?

ಒಂದು ಘಂಟೆಗಿಂತಲೂ ಕಡಿಮೆ □; ಒಂದು ಘಂಟೆ □; ಎರಡು ಘಂಟೆ □;

ಮೂರು ಘಂಟೆ □; ಮೂರು ಘಂಟೆಗಿಂತಲೂ ಹೆಚ್ಚು □.

೧೧. ಮಗು ಹಿಂದಿನ ಯಾವುದಾದರು ಪರೀಕ್ಷೆಯಲ್ಲಿ ವಿಫಲನಾಗಿದ್ದಾನೆಯೇ /ವಿಫಲಳಾಗಿದ್ದಾಳೆಯೇ?

ಹೌದು □; ಇಲ್ಲ □.

ಆಗಿದ್ದಲ್ಲಿ, ಎಷ್ಟು ಬಾರಿ?

ಒಂದು ಬಾರಿ □; ಎರಡು ಬಾರಿ □; ಎರಡಕ್ಕಿಂತ ಹೆಚ್ಚು ಬಾರಿ □.

೧೨. ಮನೆಯಲ್ಲಿ ಯಾರಿಗಾದರು ಅಂಗವೈಕಲ್ಯತೆ ಇದೆಯೇ?

ಅ. ಇದ್ದಲ್ಲಿ, ಯಾವ ಅಂಗವೈಕಲ್ಯತೆ?

ಕುರುಡುತನ □; ಶ್ರವಣ ದೋಷ □; ಮಾತಿನ ಸಮಸ್ಯೆ □; ಬುದ್ಧಿ ಮಾಂದ್ಯತೆ □;

ಸೆರೆಬ್ರಲ್ ಪಾಲ್ಸಿ □; ದೈಹಿಕ ಹ್ಯಾಂಡಿಕ್ಯಾಪ್ □; ಅನೇಕ ಅಂಗವೈಕಲ್ಯಗಳು □;

ಬೇರೆ ಇದ್ದಲ್ಲಿ, ಯಾವುದು? _____

ಆ. ಮಗುವಿಗೆ ಅಂಗವೈಕಲ್ಯ ಹೊಂದಿರುವ ವ್ಯಕ್ತಿಯೊಂದಿಗೆ ಇರುವ ಸಂಬಂಧ _____