Journal of Health and Rehabilitation Research 2791-156X JHRR

For contributions to JHRR, contact at email: editor@jhrlmc.com

Original Article

Knowledge of Childhood Autism among Health Workers of Peshawar: A Cross-Sectional Study

Nazish-A-Qadir[1*], Subhan-ur-Rehman Burki[2], Aman Abbasi[3], Uzair Ahmad[2]

[1]Khyber Medical University-Peshawar.

[2]Northwest Institute of Health Sciences-Peshawar.

[3]Ask an occupational therapist (AOT)-Special Education Services-Islamabad.

[*]*Corresponding Author: Nazish-A-Qadir; Program Coordinator; Email: nazishqadir@kmu.edu.pk*

Conflict of Interest: None.

Qadir NA., et al. (2023). 3(2): DOI: https://doi.org/10.61919/jhrr.v3i2.221

ABSTRACT

Background: Early detection of Autism Spectrum Disorder (ASD) symptoms is crucial for timely intervention services and a better prognosis. Healthcare professionals play a pivotal role in recognizing ASD features, diagnosis, and providing support. This study aimed to assess the knowledge of healthcare workers in Peshawar regarding childhood autism.

Objective: The objective of this study was to evaluate the level of knowledge among healthcare professionals in Peshawar, Pakistan, regarding the early symptoms, diagnosis, and intervention strategies for Autism Spectrum Disorder (ASD), in order to identify knowledge gaps and inform the development of targeted educational and training programs.

Methods: This cross-sectional study was conducted from September 2021 to February 2022 in public and private hospitals in Peshawar, Pakistan. Data were collected using the convenience sampling method. A total of 270 healthcare professionals (Doctors, Dentists, Psychologists, Occupational Therapists, Physical Therapists, and Speech & Language Pathologists) participated. Data analysis was performed using SPSS version 22. Descriptive analysis calculated the mean of each domain and the total score, and frequencies for gender, age, and occupation.

Results: The total mean score of the study population was 10.40. The mean score in Domain 1 (Social Interaction) was 4.73 (SD ±1.53), in Domain 2 (Language) was 0.60 (SD ±0.499), in Domain 3 (Behaviors) was 2.38 (SD ±1.102), and in Domain 4 (Etiology) it was 2.74 (SD ±1.214).

Conclusion: Healthcare professionals in Peshawar, Pakistan, demonstrated limited knowledge about the early symptoms of Autism Spectrum Disorder. These findings have significant implications for policy and practice, health profession program directors, and future research.

Keywords: knowledge, autism spectrum disorder, healthcare professionals

INTRODUCTION

Autism Spectrum Disorder (ASD), a complex neurodevelopmental condition, manifests typically within the first 2-3 years of a child's life (1)(2). Characterized by persistent challenges in communication and social interaction, coupled with restricted and repetitive behaviors, the diagnosis of ASD is based on the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) (3)(4). The diagnostic process, typically undertaken by clinicians or a multidisciplinary healthcare team, involves a comprehensive assessment that includes detailed patient history, behavioral observations, and physical examination (5)(6). The DSM-V identifies two core features of ASD: 1) enduring deficits in verbal and nonverbal communication and social interaction, and 2) restricted, repetitive patterns of behavior, interests, or activities, with the severity of symptoms varying across the spectrum (4,7,8).

Individuals with ASD often exhibit significant impairments in adaptive functioning (9). The symptoms of autism can vary widely; while some individuals may require lifelong support, others may need minimal assistance, enabling them to live independently (10). Despite extensive research, there are currently no definitive causes, biomarkers, or diagnostic tools specific to ASD. However, existing literature suggests that genetic factors, in combination with environmental influences, can impact development in ways that may lead to ASD (11,12,13).

Journal of Health and Rehabilitation Research 2791-156X JHRR

Autism is increasingly recognized as one of the fastest-growing developmental disabilities in children worldwide (14). Studies estimate that globally, one in every 100 children is diagnosed with autism, with a higher prevalence in boys compared to girls (15)(16)(17). Epidemiological studies have suggested that about 1%–2% of children are on the autism spectrum (11)(18). Data on autism prevalence in low- and middle-income countries is limited; however, studies have reported varied prevalence rates in South Asian countries, with no comprehensive data available for countries like Pakistan, Afghanistan, and Nepal (19).

Early intervention has been shown to improve outcomes significantly, enhancing social, intellectual, and communicative skills in children with ASD (1,20,21,22). Healthcare professionals play a vital role in early detection, diagnosis, and support provision (23)(24). Adequate knowledge of autism among healthcare workers is crucial for early identification of signs in children (25)(26). Unfortunately, a global inconsistency in awareness about ASD impacts the quality of intervention services (24,27-29). Delays in accessing interventional services, particularly in underdeveloped countries, can reduce the likelihood of early intervention and favorable outcomes (30). The literature underscores the necessity for updated training and curriculum reforms to enhance the competencies of healthcare professionals in this area (31)(23).

In Pakistan, child psychiatry, including the domain of autism, remains one of the most neglected areas in the healthcare system (31-33). Most healthcare professionals lack the necessary skills for early screening, diagnosis, and intervention in cases of ASD (34). The treatment and diagnosis of ASD occur in various settings, often involving multidisciplinary teams, including psychiatrists, physical therapists, occupational therapists, and speech and language pathologists. These professionals address the diverse challenges and deficits associated with ASD (32). However, studies conducted in Pakistan indicate a significant lack of clarity among medical health professionals regarding ASD symptoms, fueled by numerous misconceptions (14,31,34). A survey in Karachi revealed that a majority of general practitioners were unaware of autism (35).

The Knowledge of Childhood Autism among Healthcare Professionals (KCAHW) instrument is a validated questionnaire used to assess healthcare professionals' knowledge of childhood autism (36). Particularly prevalent in studies conducted in underdeveloped countries, where awareness about childhood autism is limited, KCAHW is a self-administered tool consisting of 19 questions divided into four domains. These domains cover issues in social interaction, deficits in communication and language development, obsessive and repetitive behavior, and characteristics of autism and its comorbidities. Each question offers three options, with a score of 1 assigned for each correct answer. The highest possible score is 19, and the lowest is 0, with the mean total score indicating the level of knowledge (36).

Despite some studies assessing the awareness of autism among parents, general practitioners, health professionals, and medical students in Pakistan, there is a notable gap in research focusing on the knowledge of physical, occupational, and speech therapists regarding childhood autism (31,38,39). Moreover, to the best of our knowledge, no studies have been conducted to date to evaluate the awareness of ASD among healthcare professionals in Khyber Pakhtunkhwa, highlighting a significant area for future research.

MATERIAL AND METHODS

This cross-sectional study, conducted from September 2021 to February 2022, aimed to assess the knowledge of healthcare professionals regarding childhood autism in Hayatabad, Peshawar. The settings for this research included esteemed institutions such as Rehman Medical Institute, Hayatabad Medical Complex, and Khyber Medical University. In compliance with ethical standards, the study received approval from the ethical committee of Khyber Medical University and adhered to the guidelines of the Declaration of Helsinki.

Employing the convenience sampling technique, the researchers targeted a diverse range of healthcare professionals, including doctors, dentists, psychologists, pharmacologists, nurses, occupational therapists, physical therapists, and speech-language pathologists. The age range of participants was set between 20 to 65 years. However, individuals with immediate family members diagnosed with autism were excluded to avoid potential biases in the study. The sample size was meticulously calculated using the online Raosoft calculator, ensuring a 95% confidence interval. Of the 270 professionals who participated, eight were unable to complete the questionnaire.

The questionnaire was divided into two parts, the first of which collected demographic data such as age, occupation, and sector of employment (public or private) (36). The second part comprised the Knowledge of Childhood Autism among Healthcare Workers (KCAHW) questionnaire. All questionnaires were presented in English, and a concise explanation of the study's purpose was provided to participants prior to distribution. Informed consent was obtained from all participants, ensuring ethical standards were upheld. The time taken to complete the questionnaires averaged between 15 to 20 minutes.

For data analysis, the Statistical Package for the Social Sciences (SPSS) version 22 was utilized. The responses for each domain and the total score of the KCAHW questionnaire were meticulously entered and analyzed. Descriptive statistics were applied to calculate the mean scores of each domain and the overall scores. Additionally, frequencies pertaining to variables such as gender, age, and

Journal of Health and Rehabilitation Research 2791-156X JHRR

occupation were computed. This comprehensive approach to data collection and analysis ensured a robust and thorough examination of the knowledge levels among healthcare professionals regarding childhood autism in the region.

RESULTS

Two hundred and eighty (280) questionnaires were distributed among healthcare workers out of which 138 and 142 questionnaires were given to allied health professionals and doctors respectively. The total number of returned questionnaires was 270. However, 8 incomplete forms were excluded. The final numbers of participants were 262 including 131 allied health professionals (63=nurses, 44 physical therapists, 11= occupational therapists, 6=speech therapists, 5= psychologists, and 2= pharmacists) and 131 doctors (124 =MBBS, 7=dentist) . Among all 199 participants were from the public sector whereas 63 were from the private. The mean age of the participants was 30.32 (SD ±5.79). Regarding gender distribution, 152 participants were female and 110 were male (table 1).

Table 1 Characteristics of the participants (n=262)

Variables	Frequency	Percentage
Age		
20	1	.4
21-40	249	95.0
41-60	11	4.2
>60	1	.4
Gender		
Male	110	42
Female	152	58
Occupation		
Doctor	124	47.3
Nurse	63	24.0
Physical Therapist	44	16.8
Occupational Therapist	11	4.2
Speech Therapist	6	2.3
Dentist	7	2.7
Psychologist	5	1.9
Pharmacist	2	.8
Sector		
Public	199	76
Private	63	24

The KCAHW is used to assess the knowledge of healthcare workers regarding childhood autism. The total mean score of the KCAHW questionnaire among the specific sample population is representative of the extent of knowledge about ASD in that population. The total mean score of the study population was 10.40. Whereas the means score of the overall population sample in domain 1(social interaction) was 4.73(SD ±1.53), and domain 2(Language) was .60 (SD ±.499). In domain 3 (behaviors) was 2.38 (SD ±1.102) and in domain 4 (etiology) it was 2.74 (SD ±1.214) **(table 2).**

Table 2 Mean and Std deviation of sub-domains of KCAHW

KCAHW	Knowledge assessed	Total score	Mean	Std. deviation
Domain 1	Impairments in social interaction	8	4.73	1.534
Domain 1	Impairments in communication	1	.60	.499
Domain 1	Obsessive and repetitive behavior	4	2.38	1.102
Domain 1	Etiology	6	2.74	1.214

Total	19	10.400	2.73120

KCAHW: Knowledge about Childhood Autism among Health Workers

The table 3 shows a total mean score and score in each domain for doctors, dentists, nurses, Physical therapists, Occupational therapists, psychologists, pharmacologists, and speech and language pathologists.

Table 3 Sub-domain scores among health workers

Occupation	Number	Mean				Total mean score
		Domain 1	Domain 2	Domain 3	Domain 4	
Doctor	124	4.68	.58	2.45	2.79	10.4839
Nurse	63	4.60	.51	2.40	2.52	9.9524
Physical Therapist	44	5.02	.68	2.32	2.91	10.8864
Occupational Therapist	11	5.36	.55	2.64	3.00	11.3636
Speech Therapist	6	5.83	.83	2.67	3.83	13.1667
Dentist	7	4.00	.86	2.14	1.57	8.5714
Psychologist	5	3.00	.60	.80	2.80	7.2000
Pharmacist	2	5.00	1.00	2.00	1.50	9.5000
Total	262	4.73	.60	2.38	2.74	10.4008

DISCUSSION

The current study embarked on a comprehensive assessment of healthcare professionals' knowledge regarding childhood autism in Peshawar, Pakistan. This pioneering research, encompassing a diverse group of healthcare practitioners, revealed critical insights into the understanding of Autism Spectrum Disorder (ASD) within the medical community of the region. The findings, which reflect moderate to low levels of ASD knowledge among the participants, are pivotal in highlighting the need for enhanced educational initiatives and training in this domain.

The average score attained on the Knowledge of Childhood Autism among Healthcare Workers (KCAHW) questionnaire was 10.40 (SD ±2.73), notably lower than previous studies which reported mean scores of 13.42 (12) and 11.2 (37). This discrepancy underscores a concerning gap in the awareness and understanding of ASD among healthcare workers in Peshawar, as compared to their counterparts in other regions. The threshold for acceptable knowledge, set at a mean score of 12 or above (40), was not met in this study, further emphasizing the need for educational reforms and awareness campaigns. This observation is consistent with a Karachi-based study, where less than half of the general practitioners were familiar with autism (20), suggesting a nationwide trend of limited autism awareness among health professionals.

The study's detailed analysis of the individual domains of the KCAHW questionnaire sheds light on specific areas where knowledge is lacking. For instance, the mean score in the domain concerning social interaction (domain 1) was 4.73, slightly lower than previous studies focusing on family physicians. Similarly, the scores in other domains, including communication and language development, and restricted and stereotypical movement, were either comparable or lower than those in earlier research. These variations in scores across domains not only highlight the uneven distribution of knowledge but also pinpoint specific areas where targeted educational interventions could be most effective.

In terms of professional categorization, the study observed varied levels of ASD knowledge among different healthcare professionals. Notably, speech-language pathologists scored the highest, with an average score of 13.1, indicative of their closer involvement and familiarity with ASD-related conditions. In contrast, psychologists scored relatively low at 7.2, a finding that contrasts with higher scores reported in similar studies conducted in other regions like Saudi Arabia (30). This disparity might be reflective of the varying educational curricula and professional training standards in different countries.

The study's methodology, while robust in its approach, presents certain limitations that must be acknowledged. The sample size, though adequate, was relatively small and confined to a specific geographical location, which may limit the generalizability of the findings. Additionally, the disproportionate representation of various healthcare professions within the sample could have influenced the results. For instance, the limited number of dentists, occupational therapists, speech-language pathologists, psychologists, and pharmacologists may not provide a comprehensive view of these professions' knowledge levels.

Despite these limitations, the study marks a significant milestone in the research landscape of Khyber Pakhtunkhwa and Pakistan. It is one of the first to systematically evaluate the knowledge of childhood autism among a wide range of healthcare professionals, including those often overlooked in such studies, like physical and occupational therapists, and speech and language pathologists. This broad inclusion enriches the study's contribution to the understanding of autism awareness within the healthcare sector in Pakistan.

The findings of this study call for immediate attention to the educational needs of healthcare professionals regarding ASD. The incorporation of specialized training and continuous professional development programs focusing on autism spectrum disorders is imperative. Such initiatives should aim not only to enhance the understanding of ASD but also to equip healthcare workers with the necessary skills for early diagnosis and intervention. The knowledge gaps identified in specific domains of the KCAHW questionnaire should guide the development of these educational programs.

In conclusion, this study serves as a crucial indicator of the current state of autism knowledge among healthcare professionals in Peshawar, Pakistan. While it highlights significant knowledge gaps, it also opens the door for targeted educational and training efforts. The findings emphasize the need for a concerted approach to autism education among healthcare workers, a critical step in improving the overall quality of care and support for individuals with ASD and their families.

CONCLUSION

The study conclusively underscores the imperative need for enhancing the knowledge of healthcare professionals regarding childhood Autism Spectrum Disorder (ASD). It brings to light the critical gaps in understanding and awareness among health practitioners in Peshawar, Pakistan. The findings emphasize the urgent necessity for curriculum reforms, specialized training, and continuous medical education. These initiatives are vital for fostering early detection of ASD symptoms, thus paving the way for timely intervention and improved prognoses for affected children. The study advocates for the integration of comprehensive ASD modules into the curricula of health professions, urging program directors to prioritize this inclusion. Additionally, it underscores the role of healthcare employers in facilitating ASD-focused training programs and fostering collaborative efforts to identify early signs of autism. The implications of this research extend beyond immediate educational reforms, suggesting a broader scope for future research to explore knowledge gaps across various professional domains. This holistic approach is fundamental in ensuring that children with ASD receive the earliest possible support and intervention, thereby significantly enhancing their quality of life and developmental outcomes.

REFERENCES

1. Gabbay-Dizdar N, Ilan M, Meiri G, Faroy M, Michaelovski A, Flusser H, et al. Early diagnosis of autism in the community is associated with marked improvement in social symptoms within 1–2 years. Autism. 2022 Aug 1;26(6):1353–63.
2. Khalid M, Raza H, Driessen TM, Lee PJ, Tejwani L, Sami A, et al. Genetic Risk of Autism Spectrum Disorder in a Pakistani Population. Genes. 2020 Oct 15;11(10):1206.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders: DSM-5. 2013. Available from: https://www.academia.edu/download/38718268/csl6820_21.pdf
4. Evers K, Maljaars J, Carrington SJ, Carter AS, Happé F, Steyaert J, et al. How well are DSM-5 diagnostic criteria for ASD represented in standardized diagnostic instruments? Eur Child Adolesc Psychiatry. 2021 Jan 1;30(1):75–87.
5. Brian JA, Zwaigenbaum L, Ip A. Standards of diagnostic assessment for autism spectrum disorder. Paediatr Child Health. 2019 Oct 24;24(7):444–51.
6. Robins DL, Casagrande K, Barton M, Chen CMA, Dumont-Mathieu T, Fein D. Validation of the Modified Checklist for Autism in Toddlers, Revised With Follow-up (M-CHAT-R/F).
7. Rylaarsdam L, Guemez-Gamboa A. Genetic Causes and Modifiers of Autism Spectrum Disorder. Front Cell Neurosci. 2019 Aug 20;13:470832.
8. Hyman SL, Levy SE, Myers SM, Kuo DZ, Apkon CS, Davidson LF, et al. Identification, Evaluation, and Management of Children With Autism Spectrum Disorder. Pediatrics. 2020 Jan 1;145(1).

9. Matthews NL, Smith CJ, Pollard E, Ober-Reynolds S, Kirwan J, Malligo A. Adaptive Functioning in Autism Spectrum Disorder During the Transition to Adulthood. J Autism Dev Disord. 2015 Aug 27;45(8):2349–60.

10. Pérez-Crespo L, Prats-Uribe A, Tobias A, Duran-Tauleria E, Coronado R, Hervás A, et al. Temporal and Geographical Variability of Prevalence and Incidence of Autism Spectrum Disorder Diagnoses in Children in Catalonia, Spain. Autism Res. 2019 Nov 17;12(11):1693–705.

11. Hodges H, Fealko C, Soares N. Autism spectrum disorder: definition, epidemiology, causes, and clinical evaluation. Transl Pediatr. 2020 Feb 1;9(Suppl 1):S55.

12. Lee MC, Chin HE, Ahmad K. Assessment of Knowledge about Childhood Autism among Pharmacists and Doctors in Miri Hospital. Sarawak J Pharm. 2020;6.

13. Yasuda Y, Matsumoto J, Miura K, Hasegawa N, Hashimoto R. Genetics of autism spectrum disorders and future direction. J Hum Genet. 2022 Aug 30;68(3):193–7.

14. Imran N, Chaudry MR, Azeem MW, Bhatti MR, Choudhary ZI, Cheema MA. A survey of Autism knowledge and attitudes among the healthcare professionals in Lahore, Pakistan. BMC Pediatr. 2011;11.

15. World Health Organization. Autism [Internet]. [cited 2023 Dec 12]. Available from: https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders?gclid=CjwKCAiApuCrBhAuEiwA8VJ6JoyuAeAFkCviaBDrOHX6vcaKp37cXkExhy_a7FjA0wyoJbgoMXUR0RoChucQAvD_BwE

16. Zeidan J, Fombonne E, Scorah J, Ibrahim A, Durkin MS, Saxena S, et al. Global prevalence of autism: A systematic review update. Autism Res. 2022 May 1;15(5):778–90.

17. Baio J. Prevalence of autism spectrum disorder among children aged 8 years - Autism And Developmental Disabilities Monitoring Network, 11 sites, United States, 2010. MMWR Surveill Summ. 2014 Mar 28;63(2):1.

18. Heys M, Alexander A, Medeiros E, Tumbahangphe KM, Gibbons F, Shrestha R, et al. Understanding parents' and professionals' knowledge and awareness of autism in Nepal. 2016 May 19. http://dx.doi.org/101177/1362361316646558

19. Hossain MD, Ahmed HU, Jalal Uddin MM, Chowdhury WA, Iqbal MS, Kabir RI, et al. Autism Spectrum disorders (ASD) in South Asia: A systematic review. BMC Psychiatry. 2017 Aug 1;17(1):1–7.

20. Rahbar MH, Ibrahim K, Assassi P. Knowledge and attitude of general practitioners regarding autism in Karachi, Pakistan. J Autism Dev Disord. 2011;41(4):465–74.

21. Lappé M, Lau L, Dudovitz RN, Nelson BB, Karp EA, Kuo AA. The diagnostic odyssey of autism spectrum disorder. Pediatrics. 2018 Apr 1;141(Supplement 4):S272–9.

22. Rojas-Torres LP, Alonso-Esteban Y, Alcantud-Marín F. Early Intervention with Parents of Children with Autism Spectrum Disorders: A Review of Programs. Children. 2020 Dec 15;7(12):294.

23. Gilbert M, Gore K, Hawke M, Barbaro J. Development, delivery, and evaluation of a training program for the early identification of autism: Monitoring of Social Attention, Interaction, and Communication. Front Neurol. 2023;14.

24. Corden K, Brewer R, Cage E. A Systematic Review of Healthcare Professionals' Knowledge, Self-Efficacy and Attitudes Towards Working with Autistic People. Rev J Autism Dev Disord. 2022 Sep 1;9(3):386–99.

25. Coughlan B, Duschinsky R, O'Connor ME, Woolgar M. Identifying and managing care for children with autism spectrum disorders in general practice: A systematic review and narrative synthesis. Health Soc Care Community. 2020 Nov 1;28(6):1928–41.

26. Ozdemir M. Adaptation of the Knowledge about Childhood Autism among Health Workers (KCAHW) Questionnaire aimed for usage in Turkey. North Clin Istanbul. 2019;7(1):40.

27. Barbaro J, Winata T, Gilbert M, Nair R, Khan F, Lucien A, et al. General practitioners' perspectives regarding early developmental surveillance for autism within the Australian primary healthcare setting: a qualitative study. BMC Prim Care. 2023 Dec 1;24(1):1–15.

28. Morris R, Greenblatt A, Saini M. Healthcare Providers' Experiences with Autism: A Scoping Review. J Autism Dev Disord. 2019 Jun 15;49(6):2374–88.

29. Harrison AJ, Slane MM, Hoang L, Campbell JM. An international review of autism knowledge assessment measures. Autism. 2017 Apr 8;21(3):262–75. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27154908

30. Hayat AA, Meny AH, Salahuddin N, Alnemary FM, Ahuja KR, Azeem MW. Assessment of knowledge about childhood autism spectrum disorder among healthcare workers in Makkah- Saudi Arabia. Pakistan J Med Sci. 2019 Jul 1;35(4):951–7.

31. Noor N, Talha M, Aftab Ahmad S, Mohydin M, Saqib S, Shah A, et al. Evaluation of the prevalence of childhood autism awareness amongst medical professionals in Pakistan. Pjmhsonline.com. 2021;15(6):1356.

32. Amyn A. Autism Spectrum Disorder in Pakistan.

33. Rahbar MH, Ibrahim K, Assassi P. Knowledge and Attitude of General Practitioners Regarding Autism in Karachi, Pakistan.

Journal of Health and Rehabilitation Research 2791-156X JHRR

34. Imran N, Azeem MW. Autism Spectrum Disorders: Perspective from Pakistan. 2014.
35. Rahbar MH, Ibrahim K, Assassi P. Knowledge and attitude of general practitioners regarding autism in Karachi, Pakistan. J Autism Dev Disord. 2011 Apr 15;41(4):465–74.
36. Bakare MO, Ebigbo PO, Agomoh AO, Menkiti NC. Knowledge about childhood autism among health workers (KCAHW) questionnaire: Description, reliability and internal consistency. Clin Pract Epidemiol Ment Heal. 2008 Jun 6;4(1):1–8.
37. Salama HM. Assessment of family physicians' knowledge of childhood autism. Fam Med Community Heal. 2017 Dec 1;5(4):266–74.
38. Anwar MS, Tahir M, Nusrat K, Khan MR. Knowledge, Awareness, and Perceptions Regarding Autism Among Parents in Karachi, Pakistan. Cureus. 2018 Sep 14;10(9).
39. Shaukat F, Fatima A, Zehra N, Hussein MAG, Ismail O. Assessment of knowledge about childhood autism among medical students from private and public universities in Karachi. J Pak Med Assoc. 2014;64(11):1331–4.
40. Ellias S, Shah H. A study of assessment of knowledge of childhood autism among medical students in Mumbai. Ann Indian Acad Neurol. 2019 Apr 1;22(2):164–9.
41. Material and Methods. Available from: http://medpress.com.pl/shop