

The Pragmatic Assessments in Children: A Narrative Review

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Review Article

Abstract

Introduction: One of the important areas of language is pragmatics, which describes the correct use of language for social interaction. Since tests are tools for quantitation of speech and language abilities, they are needed in order to assess, screen, describe, diagnose, and treat various aspects of language. The aim of this study was to review the existing tests in the area of language pragmatics and collect data about their subtests, scoring, administration, age range, and finally their application in clinical and research contexts in children.

Materials and Methods: In order to review the common tests of language pragmatics, an electronic search through Web of Science, PubMed, Scopus, Medline, Google Scholar, and Ovid databases was done between the years 2000 to 2020. The keywords were “Pragmatics”, “Language”, “Means”, “Tests”, “Tools”, “Diagnosis”, “Measurement”, and “Evaluation”. The inclusion criteria were access to the full text of the article, and the article language (either English or Persian).

Results: In this study, 18 tests and a checklist were retrieved from 25 studies for further study. Among them, only four tests and one checklist were for sole assessment of pragmatics and 14 other tests were for assessing all aspects of language.

Conclusion: Some tests have recently been used more commonly due to the specialization of their subtests. Reviewing language pragmatics tests shows that the Test of Pragmatic Language-Second Edition (TOPL-2) was the most acceptable test due to the assessment of comprehension-expression areas, standardization for healthy children or children with disorders, translation into several languages, and high psychometric characteristics; however, the use of multiple tests is recommended for a comprehensive and integrated assessment.

Keywords: Test; Interaction; Pragmatics; Children; Psychometric properties

Citation: Bahrami B, Fekar-Gharamaleki F. **The Pragmatic Assessments in Children: A Narrative Review.** J Res Rehabil Sci 2021; 17: 1-8.

Received: 12.04.2020

Accepted: 27.10.2020

Published: 06.03.2021

Introduction

Pragmatics refers to the study of the use of language in real context and situations by speakers and listeners (1). Therefore, pragmatics is the assessment of the speaker's purpose and the proper use of language to understand ideas or interact in society (2,3). Children soon begin to learn social rules. For example, the infant makes eye contact for interaction and learns to use non-verbal knowledge first and then verbal expressions as their language develops (4).

Loss of pragmatic communication skills impairs an individual's ability to convey a message and communicate (5). Due to the complexity of the language pragmatic behaviors, it is difficult for many therapists to evaluate it, leading them to use non-standard

observational methods, and challenging the results of interventions (4,5). Children with social communication disorder (SCD) often experience communication breakdowns due to deficits in practical and conversational skills (1,5). Significant deficits in verbal and non-verbal communication in children with SCD create problems in participation and maintaining social relationships, which in turn cause educational and occupational problems (5). Therefore, it is important to provide therapies that focus on children's conversational skills (5,6). Given the results of a study, pragmatic disorders may have destructive effects on the development of relationships with peers and cause behavioral problems in primary school children (6-8). In other words, 18-month-old children with speech-

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language problems show social problems in relation to their peers. Besides, the early difficulties of social participation in playing with peers put children at risk of social exclusion, and if not treated, this trend of problems in social interactions will continue forever (8). All of the above indicate a close relationship between the ability of pragmatics and social performance.

Due to the wide impact of language on communication, it is very important to study the pragmatics profile by providing appropriate tools and designing standardized tests and interventions focused on these skills can prevent communication and educational failures of these children (7). Contrary to the relationship between pragmatic deficits and language disorders in children (6,7), so far this language area has not been well studied and standardized tests have not been designed for it, especially in Iranian languages. Tests are very important in screening children, conducting a comprehensive evaluation, identifying strengths and weaknesses, starting point of the intervention, general intervention plan, and reviewing progress (5-7). Understanding of the existing tests, in addition to increasing awareness and insight, can be useful in clinical and research areas in children. Therefore, the present study is conducted with the aim to investigate more details of pragmatics tests and compare them with each other to help researchers and therapists design and select appropriate tests.

Materials and Methods

This study was a review of common language pragmatics tests. For this purpose, electronic searches were conducted in the Web of Science, PubMed, Scopus, Medline, Google Scholar, and Ovid databases from 2000 to 2020. The purpose of the study was to collect the existing tests and provide information about the subtests, method of implementation, scoring, and their application in children. The study process was conducted in two general steps. First, in order to obtain a comprehensive list of pragmatics tests, an extensive search was made in the databases using the keyword "Pragmatics" along with at least one of the words "Social Communication" and "Interaction". If the above words were used in the title, abstract, or keywords, the articles were included in the study. To check which of the tests has been translated in Iran and its validity and reliability have been confirmed, a search was also performed in Magiran and Scientific Information Database (SID) databases with the keywords "Tools, Diagnosis, Test, Evaluation, and Language pragmatics". Thus, a list of pragmatics tests was extracted and from a total of 25 research and review articles, 18 tests and 1

checklist that met the inclusion criteria were selected. The inclusion criteria included access to the full text of the article to introduce the test as well as the studies published in English or Persian. Papers presented at the conferences were not used. In the second stage, which was conducted with the aim of searching for more complete information, using the name of the test along with at least one of the words "Validity, Reliability, and Accuracy", the above databases were referred again and the articles containing these words in the title, abstract, or keywords sections entered the study.

Results

After searching in different databases, 18 tests and 1 checklist in this field were received and in the next steps, detailed test information was extracted. Of these 18 cases, 4 were tests and checklists specifically to assess the field of language pragmatics and the other 14 were to assess the entire language domains. Then detailed information of tests and checklist were extracted. The search for this information included the name of the test, author, publisher, year of publication, age range of the test, and duration of performance; the tests are introduced in the following. A summary of the tools that have been validated and localized in Iran is given in table 1.

Specific Pragmatic Examinations

Test of Pragmatic Language (TOPL): This standard test was designed to assess the ability of language pragmatics and social communication in students aged 6 to 18, which includes seven aspects: "Physical regulation, audience, speech subject, speech purpose, visual-motor cues and abstract concepts, effectiveness, and appropriateness" (7,10). This test has a total score of 100 and a score less than 90 is abnormal, in which the student responds to the verbal messages provided by the examiner and the color pictures in the guide (8). The main applications of this test are identifying people with social language deficits, determining individual strengths and weaknesses, preparing a treatment plan, and evaluating meta-pragmatic skills, and its execution time is 45-60 minutes (9). Due to the fact that the TOPL test does not present the separation of function into its 7 main parts, it makes it difficult to formulate therapeutic goals (10). The test is suitable for assessing children with SCD (8,9). It is also more suitable for assessing students with low intelligence quotient (IQ) and children with cognitive impairment or difficulties in theory of mind (10,11). The main language of this test is English, but it has been translated into various languages including Arabic, French, Brazilian, and Italian and its validity and reliability have been reported as high (8).

Table 1. Summary of language pragmatics tests in children

Test name	Reference	Researcher and year of publication of Persian validation	Name and number of sub-tests	Age range usable	Area of use
TOPL	Phelps-Terasaki (9,10)	Not available.	7 subtests (physical adjustment, audience, subject of speech, purpose of speech, visual-motor cues, abstract concepts, appropriateness of pragmatic skills)	6 to 18 years	Assessment
LUI	O'Neill (12)	Not available.	3 subtests (communication with gestures, communication with words, longer sentences)	18 to 47 months	Assessment
The Pragma Test	Loukusa et al. (13)	Not available.	5 subtests	Information is not available.	Assessment
PLSI	Alev et al. (14)	Not available.	3 subtests (personal interaction skills, social interaction skills, classroom interaction skills)	5 to 12 years old	Screening
Developmental Neuropsychological Assessment	Brooks et al. (15)	Not available.	32 subtests	5 to 6 years old	Assessment
LCT-A	Ward-Lonergan et al. (16)	Not available.	5 subtests (main idea, details, reasoning, vocabulary and semantics, message comprehension)	12 to 18 years old	Assessment
SLDT	Zeberlein (17)	Not available.	5 subtests (inference, language interpretation, social, problem solving, social interpretation, interpretation of ironic statements)	12 to 18 years old	Diagnosis
TILLS	Nelson et al. (18)	Not available.	15 subtests	6 to 18 years	Diagnosis
TOLD	Wong and Roadhouse (19)	Hassanzadeh	6 main subtests and 3 secondary subtests	8 to 17 years old	Assessment
TOPS	Bowers et al. (20)	Not available.	5 subtests	6 to 12 years old	Assessment
CASL	Rehfeld and Padgett (21)	Not available.	15 subtests	3 to 21 years old	Assessment
PLOS	Newcomer and Hammill (22)	Not available.	30 subtests	8 to 17 years old	Assessment
FCP	Santos and Fernandes (23)	Not available.	10 subtests	3 years and above	Assessment
SEE	Wiig (25)	Not available.	5 subtests (recognizing facial expressions, identifying shared feelings, recognizing emotional reactions, understanding social points, understanding conflicting messages)	6 to 12 years old	Assessment
SSIS	Gresham and Elliott (26)	Not available.	3 subtests	3 to 18 years old	Screening
CELF	Overvliet et al. (27)	Not available.	7 subtests	5 to 21 years old	Assessment
TLC	Wiig and Secord (28)	Not available.	7 subtests	9 to 18 years old	Assessment
CADeT	Johnston (28)	Not available.	3 subtests	3 to 9 years old	Diagnosis
CCC	Bishop (30)	Baghbani et al.	10 subtests (speech, syntax, concepts, coherence, inappropriate beginning, stereotyped speech, use of text, nonverbal communication, social relations, interests)	4 to 16 years old	Screening

TOPL: Test of pragmatic language; LUI: Language Use Inventory; PLSI: The Pragmatic Language Skills Inventory; LCT-A: Listening Comprehension Test-Adolescent; SLDT: Social Language Development Test; TOLD: Test of Language Development; TILLS: Test of Integrated Language and Literacy Skills; TOPS: Test of Problem Solving; CASL: The Comprehensive Assessment of Spoken Language; PLOS: The Pragmatic Language Observation Scale; FCP: The Functional Communication Profile; SEE: The Social Emotional Evaluation; SSIS: The Social Skills Improvement System; CELF: The Clinical Evaluation of Language Fundamentals; TLC: The Test of Language Competence; CADeT: The Communication Abilities Diagnostic Test; CCC: The Children Communication Checklist

Language Use Inventory (LUI): This questionnaire is the only standard parent-centered test designed by O'Neill to evaluate basic language and pragmatics in children aged 18-47 months and published in 2009 (12). The LUI questionnaire consists of three sections: "Communication with gestures, communication with words, and longer sentences" and has 180 yes/no questions, which can identify children with delay or impairment in pragmatic development and identify the ones in need of further evaluation (12). Parents and therapists can complete it in about 20 minutes, reporting it as enjoyable, interesting, and easy (10). LUI is used in Canada, Australia, New Zealand, Ireland, Scotland, and the United Kingdom and has been translated into more than 10 languages (8,12). The scores are reported as a percentage and the child's performance is compared with age and gender peers, providing the possibility of comparison of the children's progress speed (12). The hardware and online versions of this questionnaire is now readily available to professionals, and due to its high reliability and validity, it is known as a standard tool for assessing children's pragmatic skills (9,11,12).

The Pragma Test: The Pragma test was designed to measure the use of social context and language and to understand goals, thoughts, ideas, and feelings, and contains 39 items that require an understanding of the implication of each statement (13).

In the Pragma test, the presented text includes short verbal expressions with pictures, characters, toys, or stories that minimize the need for memory and the children's response is scored at 0 and 1 and the duration of the test is 30-60 minutes (13). The test helps differentiate children with the autism spectrum disorder (ASD) from children with Rett syndrome (13-15). The intraclass correlation coefficient (ICC) reliability for response scores and descriptive scores was 0.980 and 0.944, respectively, indicating a reliable score (11-14).

The Pragmatic Language Skills Inventory (PLSI): This inventory is for the age range of 5-12 years and consists of 45 items and 3 subtests including "personal interaction skills, social interaction, and classroom interaction" for teachers and specialists and is very useful for rapid screening (14). The implementation of this scale takes 5-10 minutes and its cut off scores help the examiner to make a decision to conduct a comprehensive language assessment (14,15). The reliability study results yielded Cronbach's alpha coefficients of classroom interaction, social interaction, and personal interaction as 0.96, 0.98, and 0.95, respectively. The

Turkish version of PLSI is also available (12-15).

Language tests

Developmental Neuropsychological Assessment: The developmental neuropsychological assessment is a comprehensive and integrated test for assessing the neural abilities of children and adolescents, which consists of 32 subtests and 6 areas including "cognitive function, language, memory and learning, sense and movement, social perception, and visual processing", the original version of which consisted of 2 to 5 tasks designed for children ages 5 to 6 (15). This test was designed 30 years ago in Finland and then in Swedish (9). In general, evidence of its internal reliability has been reported to be sufficient to high in most cases (15).

Listening Comprehension Test-Adolescent (LCT-A): This test assesses adolescents' ability of listening comprehension, which is performed by a specialist in language disorders (16). This test emphasizes integrated cognitive and auditory processes. The implementation of the test takes 40 minutes and it is used to identify students with specific language deficiencies and measures the student's strengths and weaknesses in auditory comprehension skills in the classroom (11,16). The LCT-A test consists of 5 subtests "main idea, details, reasoning, vocabulary, and semantics and message comprehension" and the answer to each question is recorded with 0 and 1 in the form as correct or incorrect, respectively (14-17). The reliability coefficient of the test has been reported to be 0.89 (16).

Social Language Development Test (SLDT): This test focuses on social interpretation and interaction with peers in adolescents and is comprised of 5 subtests "inference, social language interpretation, problem solving, social interpretation, and ironic speech interpretation" which is scored as 0 and 1 (17). The SLDT test distinguishes healthy adolescents from those with language learning disorders and ASD (10,18). The reliability of the test was 0.85 and the mean Cronbach's alpha coefficient of the subtests and the social language interpretation index was respectively 0.77-0.92 and 0.94, indicating a high internal consistency (IC) (17).

Test of Integrated Language and Literacy Skills (TILLS): The comprehensive and normative reference for language and literacy skills that is focused on three objectives: "Identifying language and literacy disorders, strengths and weaknesses, and tracking changes in students' language and literacy skills" (18). The test consists of 15 subtests and allows the examiner to evaluate and compare the skills of 6-18 year old students at both sound/word and sentence/discourse levels in four oral, speaking,

reading, and writing modes (11,17-19). The main subtests can be implemented in 25-45 minutes and the comprehensive assessment is usually performed in 90 minutes or less. Reliability correlation between variables has been reported from 0.84 to 0.99 (10,18).

Language Development Test (TOLD): This test assesses the oral language skills of 8 to 17-year-old students compared to their peers and records the strengths and weaknesses in oral language skills and progress (19). The TOLD test consists of 6 main tests and 3 sub-tests and lasts 30-60 minutes and presents scores as a percentage that is understandable to parents (19,20). The subtest results can be combined to provide overall scores for the main dimensions of language, including semantics and grammar, comprehension, organization, speaking, and general language ability (10,19). Extensive research was conducted to validate this test, with the results indicating that the internal structure of the test is correct and its results are suitable for a wide range of groups (10,11).

Problem Solving Test (TOPS): This test provides the ability of school-age children to integrate semantic and linguistic knowledge and the ability to reason through visual stimuli and verbal responses (22,23). Each item is assigned a score of 0, 1, or 2 based on the quality of the answer and the test takes 35 minutes (20). Linguistic adequacy shows how a student's language skills affect his or her ability of thinking, reasoning, problem solving, inference, classification, association, prediction, determining reasons, sequence, and understanding the path. The TOPS test focuses on a wide range of language-based thinking skills, including "analysis, solution-building, and emotional thinking" (19,20). The mean Cronbach's alpha coefficient was 0.82 and the cut-off score of the indices was between 90 and 92 (20).

The Comprehensive Assessment of Spoken Language (CASL): This tool has been designed for children and adolescents 3 to 21 years old and includes 15 items to assess comprehension and spoken language and lexical/semantic, syntactic retrieval, metalinguage, and pragmatics (21). The scores obtained include standard scores based on age and section (24). The test takes 30-45 minutes and has high reliability (21).

The Pragmatic Language Observation Scale (PLOS): This scale is implemented by teachers to assess the daily discourse of students aged 8 to 17 and has 30 normative items (22). The average test time is 5-10 minutes, and teachers and experts evaluate items on a five-point scale (10,19). The scale has been designed for "referral, comprehensive assessment of spoken language, facilitation of treatment planning,

and monitoring of the effectiveness of interventions" whose validity and reliability have been proven (9,22).

The Functional Communication Profile (FCP): This test allows speech therapists and special educators to assess some unique communication skills in children with developmental delays of 3 years or more (23). The FCP test also examines verbal expression and is suitable for individuals with mild to deep impairments (10,22-24). The test takes between 45 and 90 minutes (23).

The Social Emotional Evaluation (SEE): This assessment consists of 5 subtests, including "recognizing facial expressions, identifying shared feelings, recognizing emotional reactions, understanding social points, and understanding conflicting messages such as jokes and sarcasm" (which allows for the assessment of social language) (23). The SEE test assesses the higher level of social and language skills that students aged 6-12 years need to successfully interact in everyday situations at home, school, and society. This test is suitable to identify the language, social, and emotional needs of students with ASD, emotional disorders, and inability to learn or an attention deficit disorder (10,24,25). The reliability of the scale is reported to be more than 88% (24).

The Social Skills Improvement System (SSIS): This scale is suitable for screening and classifying students aged 3 to 18 years suspected of having social deficits and is formed of 7 social domains: "communication, cooperation, claim, responsibility, empathy, interaction, and self-control" and 5 behavioral domains including "introversion, extroversion, aggression, hyperactivity/attention deficit, and ASD" (11,24). The SSIS test has been translated into English and Spanish and its reliability coefficient has been calculated to be 0.62 and 0.55 for the teacher form and for the parent form, respectively (25).

The Clinical Evaluation of Language Fundamentals (CELF): This assessment was designed to assess the language and communication skills of 5 to 21-year-old students in a variety of contexts, determine the presence of language disorders, describe the nature of the language disorders, and plan treatment (26). The CELF test identifies the language strengths and weaknesses of the students and includes a number of tests, each designed to assess specific language skills, and each test can be performed independently (24). The overall reliability of the test was not adequate (26).

The Test of Language Competence (TLC): This test has been designed at two levels of children 5-9 years old and 9-18 years old to evaluate the semantics, syntax, and pragmatics as well as the contextual and situational needs of discourse (24,27). The TLC test has 4 subtests that are completed in 60 minutes (27) and its validity has been reported very good, with its accuracy being 93% (27).

The Communication Abilities Diagnostic Test (CADeT): This test is the standard scale for measuring language development in 3-9 year olds that samples the syntactic, semantic, and functional features of the children's language during play, storytelling, and real-world situations. (28). The CADeT test is sensitive to language development in children aged 3-5 years and is useful for detecting language delay or deficiency (11,24,28).

The Children Communication Checklist (CCC): This checklist is the latest version that screens for communication problems in children aged 4-16 and consists of 70 items and 10 subscales including "speech, syntax, concepts, coherence, improper start, stereotyped speech, use of text, non-verbal communication, social relationships and interests" and is completed by parents or caregivers (24,30). This checklist is used to screen children with suspected language deficits and functional disorders in children with communication problems and ASD, and its implementation time is 5-15 minutes (29,30).

Discussion

The aim of this study was to collect and compare language tests in children so that therapists can more easily access the desired test information. The pragmatic ability is the proper use of language for communication and social interaction, which is very important in the evaluation and treatment of speech and language disorders (3,7). Social pragmatics is a very wide field of language and not a single test can examine all its dimensions in different contexts. Therefore, comprehensive and integrated assessments are important (31). In addition to collecting, categorizing, and expressing the characteristics, advantages, and limitations of language pragmatics tests, the present review study can be helpful in providing readers with a comprehensive view of the tests, including assignments used, target population, assessment areas, implementation method or scoring, and reliability and it is a good source for getting acquainted with the most widely used and important tests.

For a comprehensive assessment of language disorders, a separate assessment of this area of language is very important; because careful evaluation and

intervention of pragmatics will make positive changes in communication, social, and academic development. Many researchers have confirmed the association between language disorder and social disability (2,5,30). In preschool children aged 3 to 4 years, the LUI scale can be used to assess aspects of pragmatic communication, which has been designed to identify children with delayed or impaired pragmatic development (11). For children 4 to 6 years old with SCD, the CCC scale, and for children 6 to 12 years old, standard tools including TOPS, PLOS, SEE, and SSIS tests are used (8,17,22,23,30). It is important to note that the second version of the TOPL test is suitable for children with cognitive impairment and IQ less than 70 and consists of questions with rules of polite behavior (10). Children with moderate IQ or severe speech retrieval impairment perform poorly on this test (17). For children 12 to 18 years old, standardized tools TOPS, PLOS, SEE, and SLDT are often used, and if they have significant problems in the field of pragmatics, the TOPL-2 test is used (8,17,23,30).

It is important to know the limitations of the tests, and there are currently no standardized pragmatics tests for bilingual and multicultural children, and all of the above-mentioned standard tools can be used in children with suspected SCDs (14-17). Review of the tests showed that the TOPL-2 test was more acceptable (8,9).

The TOPL-2 and SEE tests are the reference norm and are used to determine students' level of performance (15-17). The TOPL-2 test does not provide a breakdown of functional details and, as a result, makes it difficult to formulate treatment goals (10). In addition, based on the targeted skills in the two tests, they seem to be suitable for students with below-average IQ or mental theory problems, but not for students with severe SCD (9,10). For students with moderate IQs and milder SCDs, the elementary or adult versions of TOPS and SLDT can be used (8-10,17,30). In adolescents with a mental age below the chronological age, non-standard implementation of the elementary test versions is recommended; Because it is useful for determining the strengths and starting points of treatment (26). Finally, pragmatic clinical evaluation can be used for children with difficulty understanding gestures and inference and participation in discussion, the disadvantage of which is that the age range starts from 9 years old and is not used in young children with metalingual disabilities (25,26).

Inclusion of the LCT test in this list is a bit strange, but it should be noted that this test has text-based questions that require a combination of information to identify the main ideas. In other words, this test assesses the student's ability to participate in Gestalt processing and identify the main message of the text or story (16). It

is also recommended to use it for problem solving and inferential, empathetic, and decision-making abilities in older children. Therefore, it is a useful tool for adolescents with language problems (15-17).

Limitations

One of the limitations of the present study is the lack of access to details of some tests. On the other hand, not all tests are performed in all languages and cultures and it is not possible to compare them with each other.

Recommendations

Considering the results of the present study and the need to pay attention to language pragmatic skills in children with developmental disorders, it is suggested that in order to give more importance to this field, the required tests in this field be translated and designed in different age and language levels in our country, in addition to examining their validity and reliability.

Conclusion

Significant progress has been made over the recent years in the area of relation of pragmatics with language disorders, educational achievement, and occupational success, but this important area of language has been neglected over time and no coherent test has been designed to assess it. Examining the relevant articles, it is clear that some tests have been used more for various reasons such as ease of implementation, appropriate psychometric information, and a wide age range, and tests that were more comprehensive were more used in articles and have more research value. However, a comprehensive assessment cannot be limited to one test, and it is recommended that multiple assessment programs and functional and descriptive assessments be used for integrated intervention and identification of the child's strengths and weaknesses.

Acknowledgments

The authors would like to appreciate all the researchers whose treatment methods were used in

the present review study. The Clinical Council and the Vice Chancellor for Research of Tabriz University of Medical Sciences are also appreciated for their cooperation in conducting this study.

Authors' Contribution

Boshra Bahrami: Study design and ideation, study financial, support, executive, and scientific services, providing study equipment and samples, data collection, analysis and interpretation of results, specialized statistical services, manuscript preparation, specialized manuscript evaluation in terms of scientific concepts, approval of the final manuscript to be submitted to the journal office, responsibility to maintain the integrity of the study process from the beginning to the publication, and responding to the referees' comments; Fatemeh Fekar Gharamaleki: study design and ideation, study financial, support, executive, and scientific services, providing study equipment and samples, data collection, analysis and interpretation of results, specialized statistical services, manuscript preparation, specialized manuscript evaluation in terms of scientific concepts, approval of the final manuscript to be submitted to the journal office, responsibility to maintain the integrity of the study process from the beginning to the publication, and responding to the referees' comments.

Funding

The present study was prepared based on a review of sources with approval code 63893 and ethics code IR.TBZMED.REC.1398.1035 and with the financial support of Tabriz University of Medical Sciences.

Conflict of Interest

The authors do not have a conflict of interest. Fatemeh Fekar Gharamaleki and Boshra Bahrami conducted basic studies related to this project. Fatemeh Fekar Gharamaleki has been working as an instructor at Tabriz University of Medical Sciences since 2016. Boshra Bahrami is an undergraduate student at Tabriz University of Medical Sciences.

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