

Public Information Services in the Field of Communication Disorders: Comparison between Teleservice and E-service

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ABSTRACT

This study evaluates the use of information services in the field of communication disorders by monitoring two communication disorders information services operated in Israel over 8–10 months. One was an E-service and the other was a teleservice. More women than men used the services. Approximately 85% of referrals were judged as appropriate and relevant to the field, and the majority of problems could be treated sufficiently through the service.

INTRODUCTION

COMMUNICATION DISORDERS traditionally include disorders in speech, language, and hearing. These disorders are prevalent in all age categories and can affect various aspects of life. Ruben¹ estimated the prevalence of communication disorders in the United States to be from 5% to 10%. In addition, he estimated the cost of communication disorders there as \$154–\$186 billion per year. This amount is expected to increase over the next century.

In Brazil, an estimated prevalence of speech–language disorders of 4.19% was reported, based on a sample of 2980 children aged 1–11 years.² The highest prevalence of communication disorders was in the age range of 3–8 years, with a critical phase observed at age 4–5 years. The most prevalent idiopathic speech–language disorders in this study were articulatory disorders and expressive language disorders.

In Finland, Luotonen³ reported 32.5% articulation problems among children at the age of 5 years. He also noted a decrease in this pro-

portion to 18.4% by the age of 7 and to 7.4% by the age of 9. Speech delays were more common among boys than girls. Reports from Canada estimate the prevalence of language disorders among preschool children to range between 5 and 20%.⁴ In Jamaica, a survey based on a sample of approximately 5500 children aged 2–9 years revealed a prevalence of 1.4% speech disorders and 0.9% hearing disorders.⁵ Law et al.⁶ performed a systematic review of the literature on prevalence of speech and language delays. They reported a wide range of prevalence estimations for speech and language delays based on results from different studies, ranging between 1.35 and 12.6% for children aged 3–14 years.

Most studies on communication disorders focused on preschool and schoolaged children, but Culton⁷ reported lower prevalence rates of these disorders among college freshmen, with 2.42% of the students having articulation, voice, or fluency disorders. An additional 2.34% of the students were recovering from previous communication disorders.

In Israel, 24% of children referred to the public Child Development Centers are seen for language or speech delays.⁸ It was also reported that approximately 50% of these children are eventually diagnosed as requiring speech and language therapy. The prevalence of deafness among adults in Israel was estimated to range between 0.08 and 18%.⁹ A national survey of children in the age range of 2–3 years was performed based on a sample of 9492 children.¹⁰ The prevalence of speech and language development disorders was reported to be 16.8% and the prevalence of hearing impairments and deafness was 5.2%. Although several studies examined the prevalence of speech disorders³ or language disorders⁴ alone, others regarded communication disorders (including speech, language and hearing disorders) as one entity.¹ This presents a methodological problem when comparing different prevalence reports. Nevertheless, although the actual figures may vary among different studies, it is clear that communication disorders are common worldwide, especially among preschool- and schoolaged children.

The number of professionals required in the field is another issue that needs to be considered when evaluating the availability and accessibility of therapy for the general public. The number of speech–language pathologists (SLP) and audiologists in the United States was reported by the US Department of Labor to be 105,000.¹¹ This figure yields a ratio of approximately 40 clinicians per 100,000 citizens. In Israel, the Ministry of Health reports approximately 1200 SLPs and audiologists, a ratio of 19.5: 100,00 people,¹² or approximately half the US proportion.

Public health regulations in Israel require that a child referred to a communication disorders evaluation in the public health system be diagnosed within 3 months of referral. Due to the large number of referrals to the public system, and the limited number of SLPs and audiologists, this requirement is often not fulfilled. The initial evaluation for communication disorders is often delayed by 6–9 months. In light of the importance of timing in the treatment of communication disorders, this poses a serious problem for many clients. Children, parents, and adults who are concerned about

communication disorders are forced to seek professional advice from different sources. While some clients seek clinicians in private clinics, the majority seek information in more accessible and, more importantly, affordable sources.

We therefore investigated the operation and effectiveness of two communication disorders information services: E-service, a communication disorders Internet forum and; teleservice, a telephone hotline specializing in communication disorders.

The issues studied were the characteristics of the person contacting the service and the target patient, the type of the problems presented, and the response of the professionals to the referral. Since this is the first study of this kind in Israel, it was deemed desirable to examine the diversity of the communication disorders that were presented and the distribution of patients by age and gender.

Research questions included comparison between the two services regarding the reason for referral and the professional service-provider's ability to address these needs. The association between the reason for referral and the ability to respond effectively was also examined.

MATERIALS AND METHODS

Data sources

Two information services were monitored over a period of several months. The first is an E-service: a communication disorders Internet forum. This forum is one of 45 Israeli forums administered in a popular Hebrew-based medical-information website. Access to the form is free of charge and anonymous. The only requirement for participating and presenting a question in this forum is an Internet connection. The usual procedure is that people post their question on the forum and the forum manager, who is a certified and experienced SLP and audiologist who operates the service on a voluntary basis, attempts to answer all questions. In addition, other respondents both lay people, and professionals, may choose to respond or comment on the question or the answer.

The second information service monitored is a teleservice conducted by a well-acclaimed Israeli parenting periodical. The magazine's subscribers are routinely encouraged to direct questions to specialists in a variety of fields of medicine, psychology, and child care. The subscribers call the teleservice at a predetermined time and present the specialist with their questions. An experienced SLP, who is also an audiologist, is available for telephone conversations and consultation for a 3 h session, once a month. The SLP also performs this service on a voluntary basis. This service, like the E-service, is free of charge, but as described, is available exclusively for the magazine's subscribers who are predominantly parents of young children. In addition, the E-service is titled "communication disorders forum," thus covering all fields of speech, language and audiology; the teleservice is advocated as focusing on speech and language development and disorders.

Data collection

The communication disorders E-service was monitored over a period of 10 months. During this period, a total of 225 referrals was recorded. The teleservice was monitored over a period of 8 months, during which a total of 67 referrals was recorded. All referrals to both services were recorded and stored in a computerized database. All referrals were analyzed and coded according to the following parameters: gender of the person presenting the question (contact person), gender of the person to whom the question refers (target client) age of

the target client, problem presented, and answer given by the SLP.

All variables in the study were categorical (discrete), thus requiring a nonparametric statistical analysis. Hence, chi-square tests were performed to determine the significance of associations between different pairs of parameters.

RESULTS

Demographics of users

Both information services were contacted more often by women than by men. Nevertheless, as can be seen in Table 1, this gender difference of the contact person was greater in the teleservice than in the E-service and the difference was statistically significant ($\chi^2 = 9.62, p = 0.002$).

As shown in Table 1, the target-client male to female ratio was approximately 2:1. No significant difference was found between the two information services ($p = 0.699$). This ratio is consistent with previous reports of higher prevalence rates of communication disorders among male than female children and adults.^{3,13,14}

The relation between the gender of the contact person and the gender of the target client was also examined. To exclude referrals in which the contact person inquired about himself or herself, only the two younger target client age groups were included in the comparison. No association was observed between the gender of the parent and the gender of the child with the problem ($p = 0.43$).

TABLE 1. GENDER DISTRIBUTION OF CONTACT PERSONS AND TARGET CLIENTS IN THE TWO INFORMATION SERVICES

Identity	Gender	Information service					
		E-service		Teleservice		Total	
		n	%	n	%	n	%
Contact Person	Men	63	28.0	7	10.4	70	24.0
	Women	153	68.0	60	89.6	213	72.9
	Unknown	9	4.0	NA	0.0	9	3.1
Target Client	Male	128	56.9	44	65.7	172	58.9
	Female	75	33.3	23	34.3	98	33.6
	Unknown	22	9.8	NA	0.0	22	7.5
Total		225	100	67	100	292	100

TABLE 2. AGE CATEGORIES DISTRIBUTION OF TARGET CLIENTS IN THE TWO INFORMATION SERVICES

Age range	Information service					
	E-service		Teleservice		Total	
	n	%	n	%	n	%
< 5 years	87	38.7	62	92.5	149	51.0
5-10 years	16	7.1	5	7.5	21	7.2
10-18 years	14	6.2	NA	0.0	14	4.8
18 <	84	37.3	NA	0.0	84	28.8
Unknown	24	10.7	NA	0.0	24	8.2
Total	225	100	67	100	292	100

NA, not available.

The two information services were found to differ in the age range of the target clients. Table 2 shows the number of referrals for both services, arranged by age of target clients.

Target clients in the E-service was distributed among all age categories, with a large group of children under the age of 5 and a large group of adults. The teleservice, on the other hand, was presented with questions regarding only target clients younger than 10 years of age.

Since the two services are aimed at two different target populations, in terms of age and type of communication disorder, further comparison between the two services was limited to the younger target client age groups (age < 10). Within this age group, the majority of referrals (87.7%) pertained to children under the age of 5. Only 12.3% referred to children 5-10 years of age, with no statistically significant dif-

ference between the two services ($p = 0.118$). A more detailed target-client age distribution in both information services is presented in Figure 1.

Among children under 5 years of age, most referrals pertained to those between 2 and 4.

Disorders and treatment

The topics of the referrals to the information services were grouped into six categories: language, including developmental and acquired language disorders; speech, including phonological, voice, and fluency disorders; audiology, including developmental and acquired hearing disorders; swallowing and feeding; developmental, including attention deficit/hyperactivity disorder (ADHD), pervasive developmental disorder (PDD), learning disabilities,

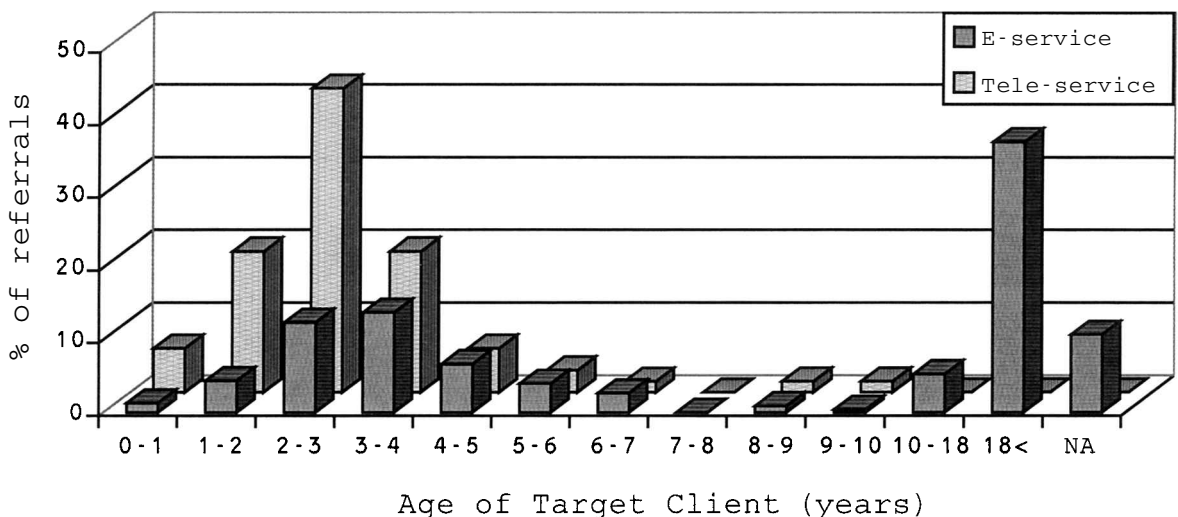


FIG. 1. Detailed age distribution of target clients in the two information services.

TABLE 3. DISTRIBUTION OF COMMUNICATION DISORDERS CATEGORIES PRESENTED IN THE TWO INFORMATION SERVICES

Disorder category	Information service					
	E-service		Teleservice		Total	
	n	%	n	%	n	%
Language	38	16.9	21	31.3	59	20.2
Speech	97	43.1	37	55.2	134	45.9
Hearing	19	8.4	NA	0.0	19	6.5
Swallowing	6	2.7	2	3.0	8	2.7
Developmental	29	12.9	5	4.5	34	11.7
Information	36	16.0	2	3.0	38	13.0
Total	225	100	67	100	292	100

NA, not available.

and general behavioral problems; and requests for general information in the field of speech, language, and hearing disorders and development, not referring to a specific client.

Table 3 summarizes the frequency of each problem category among the total referrals within the two information services.

When all age groups were included, speech and language problems were the most frequent in both information services. General information inquiries, however, were much more common in the E-service than in the teleservice, and questions in the field of audiology were presented in the E-service exclusively. These differences were statistically significant ($\chi^2 =$

20.69, $p < 0.001$). Nevertheless, when the target client age was limited to 10 years, no differences were found in the problem category distribution ($p = 0.10$). Within this age range, 46.5% of all referrals regarded speech problems and 29.4% were about language problems, while the remaining 24.1% included all other categories.

A more detailed representation of the problem distribution in the two information services is illustrated in Figure 2. In both information services, fluency disorders were the most frequent reason for referral. The second most common problem was language disorders, followed by phonological disorders (articulation).

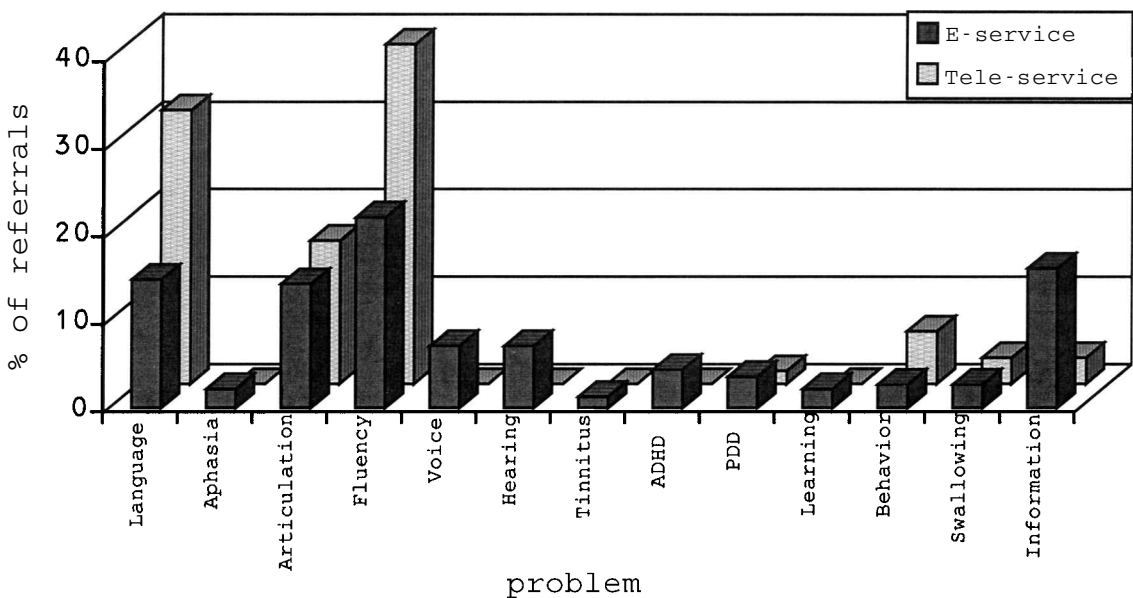


FIG. 2. Detailed distribution of referrals presented in the two information services arranged by problem category.

Each referral was categorized as appropriate or as inappropriate, according to the clinician's response. Appropriate referrals were defined as those answered by recommendation for a speech, language, or hearing evaluation; recommendation to seek another professional (i.e., psychologist, a special education specialist, otolaryngologist, general physician), and providing information. Inappropriate referrals were defined as cases in which the problem referred was considered normal and thus there was no reason for further evaluation; and when the referral was judged as not being relevant to the fields of speech-language pathology or audiology.

The proportion of appropriate to inappropriate referrals was approximately 85:15 in the E-service as well as in the teleservice (82.9% vs. 17.1% and 88.5% vs. 11.5%, respectively). No significant difference was found between the two services ($p = 0.71$).

Each referral was also coded according to whether a sufficient response could be given by the service (treatment completed), or whether additional information or treatment was warranted (treatment incomplete). Treatment completed was defined as including answers that identified normal pattern of development (thus not requiring further intervention) or provided information. Treatment incomplete, on the other hand, was defined as including answers that recommended formal speech, language, or hearing evaluation; referred to a different professional; and identified referrals as irrelevant to the field. The proportion of completed to incomplete treatment was approximately 60:40 in the E-service as well as in the teleservice (65.3% vs. 34.8% and 58.2% vs. 41.8%, respectively). No significant differences were observed between the two services ($p = 0.64$).

The relationship between the problem category and whether or not treatment was completed was also examined. In general, the proportion described above of 60:40 between completed and incomplete treatment was maintained through most categories of problems. However, two exceptions were observed. The first consisted of referrals for information requests, in which 85.3% were answered sufficiently. The other exception was the swallow-

ing disorders category, which was the only category in which the majority of cases could not be treated sufficiently (57.1%). However, only eight referrals were included in this category. Despite these differences, no statistically significant differences were found between the proportion of the treatment outcome (completed vs. incomplete) and the problem category ($p = 0.08$).

DISCUSSION

The main findings of this study can be summarized in the following five major points:

1. The distribution of communication disorders reflected in the referrals to the two information services follows the expected distribution in the population, as described in the literature.^{5,10} It therefore seems reasonable to conclude that although the consumers of the two information services may not represent the entire population, there is no evidence for sampling bias or preselection in referrals.
2. All age groups (children, adolescents, adults) are represented among consumers of the E-service. However, the relative frequency of teenagers in this sample is lower than what would be expected, based on clinical experience and the nature of the medium (Internet).
3. The two information services are comparable with respect to gender of consumers (contact person), gender of target clients, and cause for referrals. The small differences between the two services with regard to these parameters are attributed to differences in target population of each medium and differences in the professional fields covered.
4. Most referrals (close to 60%) could be fully addressed in both services. There was no association between type of problem and outcome of referral. Swallowing disorders were the exception. Most referrals concerning swallowing were directed to a professional, and could not be treated completely through the service.

5. The majority of referrals (85%) were justified clinically, with no difference between the two services.

Based on these findings we suggest that these types of services are of value. For the general public, such services can address a growing need for information regarding these kinds of disorders. For the public health system, these services can operate as a primary screening tool. Despite the fact that the teleservice enables real-time interaction between the contact person and the SLP and the E-service does not, both services appeared to be equally effective. In the era of managed health care, these services could prove very valuable. They should reduce the number of unnecessary referrals to audiology and speech pathology clinics, while still providing reliable professional advice for those in need. An additional advantage of both services is their low cost and their high accessibility for the public. The information gathered from referrals to such services, if stored and arranged properly in computerized databases, may provide clinicians and policymakers with a valuable tool in planning and designing screening methodology and treatment in the future.

The anonymity guaranteed to the users made subsequent contact with them and inquiring about their satisfaction from the service practically impossible. Yet a number of callers to the magazine hotline, as well as people addressing the E-service, who were advised to contact the service again in 3–6 months for follow-up indeed called again. In addition, other professionals as well as laypeople answered referrals to the E-service in many cases. This suggests that the users valued the services.

Both services are operated on a voluntary basis. We suggest that these services be continued and financed by the public health system. Such services could be extended to cover all fields of audiology, speech and language development and disorders by recruiting different professionals who specialize in these fields.

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