Implementation of a Program to Teach Pediatric Residents and Faculty About Domestic Violence

Rachel P. Berger, MD, MPH; Debra Bogen, MD; Tina Dulani; Elsie Broussard, MD, DrPH

Objectives: To obtain information about pediatric resident and staff knowledge, attitudes, and screening practices related to domestic violence (DV), to implement a domestic violence education program, and to evaluate whether the program resulted in changes in these 3 domains.

Design: Interventional with before and after survey evaluation.

Setting: A hospital-based, pediatric residency continuity clinic that serves families in Pittsburgh, Pa.

Participants: Pediatric residents (n=51), medicine-pediatric residents (n=6), continuity clinic faculty (n=22), and certified-registered nurse practitioners (n=5).

Results: Prior to implementation of the DV education program, respondents correctly answered questions about the prevalence of DV (74 participants [90%]), the racial distribution of DV victims (66 participants [80%]), and the significant overlap between child abuse and DV (75 participants [91%]). Seventy-nine participants (96%) believed that screening for the presence of DV was part of their role as pediatric health care providers. At baseline, 17 (21%) of the 82 participants reported that they were routinely screening for signs of DV during well-child care visits compared with 39 (46%) after attending the education program (P=.005). Among participants who attended both educational session 25% (9/36) were routinely screening for the presence of DV prior to the intervention, compared with 46% (16/35) after the intervention (P=.008). At baseline, 33 (40%) of the 82 participants had identified at least 1 case of DV in the prior 6 months compared with 45 (53%) after training. Prior to training, 18 participants (22%) were aware of resources for DV victims compared with 45 (53%) after training (P<.001).

Conclusions: To our knowledge, this is one of the first pediatric studies to demonstrate that using a short, multifaceted educational module, it is possible to change DV screening practices and to increase identification of DV victims among pediatric residents, continuity clinic faculty, and certified-registered nurse practitioners at a pediatric teaching hospital.

Arch Pediatr Adolesc Med. 2002;156:804-810
SUBJECTS, MATERIALS, AND METHODS

SITE DESCRIPTION

Children’s Hospital of Pittsburgh (CHP) is a university-based teaching hospital in Pittsburgh, Pa, with between 17 and 24 pediatric and pediatric-medicine residents in each residency class. Seventy-five percent of these residents in each class (ie, between 13 and 18 in each residency class) have a weekly half-day outpatient continuity clinic on site during which they are precepted by CHP faculty (CHP group). The other 25% of the residents in each class (ie, between 4 and 6 in each residency class) have their weekly continuity clinic in private pediatric offices in the greater Pittsburgh area (community group). These residents are taught by pediatricians in these offices who have admitting privileges at CHP, but are not faculty. Patients seen in the private practices are generally of a higher socioeconomic class than the patients at CHP, and have insurance from a third-party payer rather than from Medicaid. At the time this program was implemented, neither residents at CHP nor in the community had an established DV curriculum.

SURVEYS

After receiving approval from the CHP institutional review board, a 17-question preintervention survey was distributed to all pediatric and medicine-pediatric residents (n=57), continuity clinic faculty (n=22), and certified-registered nurse practitioners (n=5) in December 2000. The survey was divided into questions about DV knowledge (n=7), attitudes, and barriers to screening (n=4) and screening practices (n=2). There was also a single question about prior training (n=1), prior identification of DV cases (n=1) as well as 2 internal reliability questions on important anticipatory guidance issues (discipline and guns) that were not specifically discussed during the educational sessions (n=2).

At the time this survey was designed, we were unaware of any validated, reliable instruments for assessing the pediatric health care providers’ knowledge of DV. However, in the time between our preintervention survey and our intervention, Maiuro et al described the development of a 39-item validated and reliable survey instrument. Since we were unaware of the work of Maiuro et al at the time we began our study, our survey was designed based on surveys used in previously published work. Like Maiuro et al, our survey was divided into 3 categories—knowledge, attitudes, and beliefs and behaviors.

Our survey used a 5-point Likert scale to assess attitudes and barriers to screening (1, strongly disagree with statement; 5, strongly agree with statement). Questions about screening practices had 4 possible responses: “never,” “less than half the time,” “more than half the time,” and “always.” Respondents who reported that they screened “always” or “more than half the time” were classified as “routine” screeners.

The 18-question postintervention survey repeated the same questions about attitudes and barriers to screening (n=4), screening practices (n=2), identification of cases (n=2), and the internal reliability questions (n=2). Only one (n=1) question about knowledge was repeated in the postintervention survey. The remaining questions in this survey were related to the effect of the intervention, continued barriers to screening, physician perception of their competence in the field of DV, and suggestions for future educational sessions (n=8).

Surveys were distributed to all pediatric and medicine-pediatric residents and to the certified-registered nurse practitioners and pediatric faculty who precept and work with residents in the primary care center. Surveys were not sent to the community physicians (n=14) who precept the community group. Distribution was performed through a combination of hand delivery, interoffice mail, and the US mail. The survey was sent with a cover letter describing the purpose of the study and stating that the responses to the survey would be confidential, but not anonymous. The second survey was distributed in June 2001 using similar distribution techniques.

Continued on next page
INTERVENTION

Residents and faculty were invited to attend one 30-minute didactic session given by one of us (R.P.B.) on 4 separate occasions in January 2001. The sessions were given immediately before continuity clinic during a time slot reserved for resident education. The content of these sessions was based on the University of Pittsburgh Medical Center Health Systems curriculum on the appropriate health care response to DV, which was developed at the Magee-Women’s Hospital Domestic Violence Resource Center in Pittsburgh.

Attendance was taken at each session and attendees were given 2 articles about DV and its effect on children an Office Reference Manual for Recognition and Referral of Victims of Domestic Violence (an 8-page pocket-sized pamphlet published by the DV Resource Center at Magee-Women’s Hospital), and a list of local DV resources. After the lectures, a laminated copy of this list was placed in an accessible location in the primary care center. Simultaneously, DV posters ordered from The Family Violence Protection Fund (available at: http://www.endabuse.org) were hung in the waiting area and hallways around the clinic; signs about DV were hung in each of the women’s bathrooms near the clinic.

Three months after the initial didactic session, residents were required and faculty was invited to attend a 90-minute teaching session consisting of a 15-minute didactic, 12-minute videotape of testimony from DV victims, and 45-minute role-play session. During the role playing, residents and faculty were divided into groups of 4 or 5 and given common scenarios during which they would ask a parent or adolescent about DV. They practiced posing these questions to actors (social workers from the clinic who had been involved in designing the educational sessions) and then addressing the actors’ responses. The small group size ensured that each physician had multiple opportunities to practice. Attendance was taken at these sessions.

Our education program was specifically tailored to pediatric health care providers. For example, in the didactic sessions, we did not focus on the affect of DV on adults, but on the short-term and long-term affects of witnessing DV on children. When we discussed community resources, we discussed resources for women as well as for children who have witnessed DV. We discussed the logistical issue of how to arrange for older children and male caregivers to leave the examining room to provide pediatricians with the opportunity to ask women about DV. The pediatric-specific issue of documentation of DV questioning was also discussed since a male DV perpetrator has access to the child’s medical record. Perhaps most importantly, since many of the standard questions that adult physicians use to screen for DV often seem out of place in a pediatric visit, we discussed different approaches to integrating questions about DV into the pediatric visit. Participants were given examples of how to integrate questions about DV into discussions of behavior, discipline, television, guns, and family life.

DATA ANALYSIS

Data analysis was performed using SPSS version 10.1. (SPSS Inc, Chicago, Ill). The McNemar test was used to compare dichotomized responses before and after intervention. For questions designed on a 5-point Likert scale 1 (strongly disagree with the statement), 5 (strongly agree with the statement), responses were evaluated as continuous variables and a paired t test was used. For dichotomous data, differences between groups were determined by either the Pearson χ² or Fisher exact test. The Spearman rank correlation was used for comparison of ordinal variables. P≤.05 was considered statistically significant. No adjustment was made for multiple comparisons. Ninety-five percent confidence intervals (CIs) for differences were used to display the precision between the preintervention and postintervention responses. For statistical analysis, pediatric (n=61) and medicine-pediatric residents (n=6) were grouped together and referred to as trainees. Certified-registered nurse practitioners (n=5) and continuity clinic faculty (n=22) were grouped together and referred to as staff. Trainees and staff are collectively referred to as pediatric health care providers.

RESULTS

The distribution of trainees and staff, the response rates for each survey, and the attendance rates are summarized in Table 1. Overall, 82 preintervention (98%) and 77 postintervention (92%) surveys were completed. Survey response and attendance rates of trainees and staff were similar. However, compared with trainees in the CHP group (n=41), trainees in the community (n=16) had lower survey response rates (surveys 1 and 2 combined 40 participants [98%] vs 13 participants [81%]) (P=.005) and lower attendance rates at the 2 educational sessions (session 1: 30 participants [73%] vs 0 participants, P<.001; session 2: 31 participants [76%] vs 7 participants [44%], P<.001).

Sixty-three (77%) of the 82 pediatric health care providers reported having received at least 1 hour of DV training in the prior year. Before the intervention, respondents correctly answered questions about the prevalence of DV (74 participants [90%]), the racial distribution of DV victims (66 participants [80%]), and the significant overlap between child abuse and DV (75 participants [91%]). Fifty-three (67%) of the 79 respondents were aware that physicians are not mandated reporters of DV in Pennsylvania. Staff was more likely than trainees to be aware of this (88% [23 of 26 staff] vs 58% [31 of 53 trainees], P=.004). There was no difference in baseline knowledge between CHP and community residents. Given the high rate of correct responses to the knowledge questions in all groups, we felt it would be unlikely to see significant improvement after the educational sessions. As a result, the only knowledge-based question in the post-intervention survey was related to mandated reporting. After the educational sessions, there was no overall change in the number of correct responses to this question among...
the staff or trainees, although the number of interns who correctly answered this question increased from 64% (14/22) to 100% (22 ± 22) (P < .001). Despite the strong preintervention knowledge, 46 (60%) of the 77 respondents felt that the educational sessions improved their DV knowledge. There was no change in the responses to the 2 internal reliability questions before and after the educational sessions.

Attitudes and beliefs of trainees and faculty before and after intervention were measured on a 5-point Likert scale and are summarized in Table 2. Overall, there was no change in whether respondents felt comfortable discussing DV or whether they felt they had adequate time to screen for DV. However, respondents were more aware of DV resources after the intervention. The preintervention responses to these questions did not differ between trainees and staff except that staff was more likely to feel that they had time to screen for DV (mean [SD], 3.54 [1.104] vs 2.65 [0.844], P < .001). When asked to choose all of the barriers to screening during a given well-child visit, respondents most frequently cited lack of time (75%) followed by the presence of adult males (49%) or older siblings in the examination room (40%), and the feeling that the topic of DV did not fit in with certain well-child visits (44%).

Table 1. Survey Response Rates and Attendance at Training Sessions About Domestic Violence

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. (%) of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trainees (n = 57)</td>
</tr>
<tr>
<td>Survey response</td>
<td></td>
</tr>
<tr>
<td>Before intervention</td>
<td>55 (96)</td>
</tr>
<tr>
<td>After intervention</td>
<td>51 (89)</td>
</tr>
<tr>
<td>Attendance at training</td>
<td></td>
</tr>
<tr>
<td>Neither session</td>
<td>14 (35)†</td>
</tr>
<tr>
<td>1 Session</td>
<td>18 (32)</td>
</tr>
<tr>
<td>Both sessions</td>
<td>25 (44)</td>
</tr>
<tr>
<td>At least 1 session</td>
<td>43 (76)</td>
</tr>
</tbody>
</table>

*Trainees included 51 pediatric and 6 medicine-pediatric residents; staff included 5 certified-registered nurse practitioners and 22 faculty.
†Nine of 14 trainees who attended neither session were in the community group.

Reported screening practices improved after the intervention as given in Table 3. Overall, among pediatric health care providers who attended both educational sessions, 46% (16/35) reported that they were routinely screening for the presence of DV at the time of the postintervention survey compared with 25% (9/36) prior to the educational sessions (P = .008). As a subgroup, staff was not more likely to be screening after attendance at both educational sessions, although this is most likely the result of a small sample size. Overall, 22% (17/77) of the respondents reported that they had changed their screening practices; 7 respondents changed from never screening to screening less than half the time, and 10 changed from screening less than half the time to screening more than half the time. Ninety-five percent (61/64) of the pediatric health care providers who attended at least 1 educational session believed that the session(s) had influenced their screening practices. The proportion of pediatric health care providers who reported that they had identified at least 1 case of DV was greater in the 6 months after the intervention compared with the 6 months before the intervention (53% [41/77] vs 38% [31/82], P = .02). Both before and after the educational sessions, respondents who reported that they routinely screened for DV were more likely to have identified at least 1 case of DV compared with those who did not routinely screen (before intervention, 65% [11/17] vs 31% [20/65], P = .01; after intervention, 79% [19/24] vs 42% [22/53], P = .002).

After the educational sessions, 52% (40/77) of the pediatric health care providers rated their DV competence as poor or fair. Perceived competence was significantly correlated to routine screening (ρ = 0.538, P < .001) and to the pediatric health care providers’ comfort with the topic of DV (ρ = 0.560, P = .001).

Except as noted previously, responses to the surveys did not vary by sex, year of residency training, or classification as trainee or staff. Because attendance among trainees in the community group was so low, it was impossible to determine if the educational session had an equivalent effect on screening practices in the community and CHP groups.

This brief education program demonstrated that it is possible to improve the frequency with which pediatricians screen for DV during well-child care visits. The strong correlation between attendance at the educational sessions and change in reported DV screening practices points to the educational sessions as the most likely cause of the change.

The change in screening practices is based on physician report only. Ideally, physician report would be substantiated by 1 of a variety of techniques including direct observation, videotaping of patient encounters, or medical record review. The cost and time associated with these activities were prohibitive. Furthermore, since some pediatricians do not document DV screening because of confidentiality issues (a child’s medical record can be legally accessed by both parents, thus opening the door for a DV perpetrator to learn of his partner’s disclosure), medical record review might not have helped verify screening. The fact that the surveys were confidential decreases the possibility of false reporting. Though anonymous surveys might have further decreased this possibility, this would have made it impossible to compare preintervention and postintervention responses. The success of this education program may lie in the fact that in contrast to a prior survey that suggested that pediatric health care providers do not feel that DV is within the purview of pediatrics, the pediatric health care providers at CHP overwhelmingly considered screening for and discussing DV part of their role as pediatricians. The high survey response rate and the high percentage of respondents who reported routine DV screening prior to the training session suggest that CHP may not be a typical pediatric hospital. The high survey response rate is most
likely because of the ease of distribution—it was distributed in the resident continuity clinic—and the rapidity with which the survey could be completed (approximately 4 minutes). There is also a significant amount of institutional support for resident and fellow research, and the principal investigator (R.B.) was a fellow at the time this study was performed. The high rate of routine screening at baseline may be an indication of increasing public awareness about DV, increased baseline education (77% of pediatric health care providers reported that they had had at least 1 hour of DV training in the prior year), or inaccurate self-report by respondents. However, since the surveys were confidential, the respondents should not have felt a need to falsely report their screening rates. At the time of this intervention there was no hospital-based DV advocacy program and no local DV awareness raising activities at CHP that might have influenced the preintervention responses or confounded the affect of the intervention program.

It is not surprising that the staff was more likely than trainees to know that there is no mandated reporting of DV in Pennsylvania; most of the staff has practiced medicine in Pennsylvania for many years, while many of the trainees had only lived there for a few months when this survey was taken.

Even in a hospital such as ours where the atmosphere seemed ripe to introduce a DV screening program, there were significant barriers to successful implementation of the program. There was significant institutional concern about whether the hospital social workers would be able to appropriately respond to and provide needed resources to women who would presumably be identified as DV victims. Offers of support from leaders of local DV shelters and programs helped to alleviate these concerns. Another barrier was the ability to maintain the DV signs in the women’s bathrooms—for the first several weeks, the signs disappeared every few hours. After numerous discussions with all housekeeping staff on all shifts, this problem improved, although it never completely resolved.

The attendance at the training sessions was lower than expected, although comparable to attendance rates at both the “communications course” and the “family-systems curriculum,” 2 other resident and faculty education programs at CHP that are conducted at similar times of the day and for similar amounts of time. The low attendance at our training sessions by residents in the community group was particularly disappointing. The community residents received the same notification about each of the sessions as residents in the CHP group. Residents in both groups were relieved of their other responsibilities—other educational sessions. The community residents have also had low attendance at the 2 curriculum blocks mentioned earlier. As a result, we believe that their low attendance is more likely a more general problem with integration of the community residents into the primary care curriculum rather than a selection bias. The lack of a selection bias among the residents and faculty is supported by that fact that the preintervention knowledge, attitudes, or

<table>
<thead>
<tr>
<th>Question</th>
<th>Intervention Before†</th>
<th>Intervention After</th>
<th>Mean Difference‡ (95% Confidence Interval for Difference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is my role as a pediatrician to ask about DV</td>
<td>4.50 (0.60)</td>
<td>4.35 (0.83)</td>
<td>.12</td>
</tr>
<tr>
<td>I am comfortable discussing DV with my patients</td>
<td>3.28 (0.94)</td>
<td>3.43 (0.90)</td>
<td>.15</td>
</tr>
<tr>
<td>I have sufficient time to screen for DV during well-child visits</td>
<td>2.71 (1.05)</td>
<td>2.93 (1.04)</td>
<td>.10</td>
</tr>
<tr>
<td>I am aware of resources to offer patients if they are victims of DV</td>
<td>2.73 (1.06)</td>
<td>3.45 (0.93)</td>
<td>.0001</td>
</tr>
</tbody>
</table>

A 5-point Likert scale was used: 1 indicated strongly disagree with statement; 5, strongly agree with statement. Data are given as mean (SD) unless otherwise indicated.

†There was no difference in responses between staff (n = 57) and trainees (n = 27) before intervention.
‡Difference is between preintervention and postintervention responses.

| Table 2. Attitudes and Beliefs About Domestic Violence (DV)* |

<table>
<thead>
<tr>
<th>Question</th>
<th>Before†</th>
<th>After</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is my role as a pediatrician to ask about DV</td>
<td>4.50 (0.60)</td>
<td>4.35 (0.83)</td>
<td>.12</td>
</tr>
<tr>
<td>I am comfortable discussing DV with my patients</td>
<td>3.28 (0.94)</td>
<td>3.43 (0.90)</td>
<td>.15</td>
</tr>
<tr>
<td>I have sufficient time to screen for DV during well-child visits</td>
<td>2.71 (1.05)</td>
<td>2.93 (1.04)</td>
<td>.10</td>
</tr>
<tr>
<td>I am aware of resources to offer patients if they are victims of DV</td>
<td>2.73 (1.06)</td>
<td>3.45 (0.93)</td>
<td>.0001</td>
</tr>
</tbody>
</table>

| Table 3. Change in Routine Screening* Practices Before and After Intervention by the Number of Sessions Attended |

<table>
<thead>
<tr>
<th>Respondents†</th>
<th>No. (%) of Respondents/Total No. of Respondents</th>
<th>No. (%) of Respondents/Total No. of Respondents</th>
<th>P Value</th>
<th>Difference (95% CI)</th>
<th>P Value</th>
<th>Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trainees</td>
<td>9/55 (16)</td>
<td>2/11 (18)</td>
<td>.84</td>
<td>−0.02 (−0.27 to 0.22)</td>
<td>.1024 (42)</td>
<td>.01 (−0.26 to −0.46 to −0.06)</td>
</tr>
<tr>
<td>Staff</td>
<td>8/27 (30)</td>
<td>1/7 (20)</td>
<td>.66</td>
<td>0.10 (−0.36 to 0.56)</td>
<td>.61/11 (55)</td>
<td>.15 (−0.25 to −0.60 to 0.10)</td>
</tr>
<tr>
<td>Total</td>
<td>17/82 (21)</td>
<td>3/16 (19)</td>
<td>.89</td>
<td>0.01 (−0.20 to 0.23)</td>
<td>.16/35 (46)</td>
<td>.005 (−0.25 to −0.43 to −0.08)</td>
</tr>
</tbody>
</table>

*Routine screening was defined as screening during at least half of the well-child care examinations. Trainees included 51 pediatric and 6 medicine-pediatric residents; staff included 5 certified-registered nurse practitioners and 22 faculty. CI indicates confidence interval.
†Respondents answered the following: “How often do you screen for domestic violence?”
‡Comparison of preintervention and postintervention responses for those who attended 0 or 1 educational session.
§Comparison of preintervention and postintervention responses for those who attended both educational sessions.
screening rates did not differ between those who attended the sessions and those who did not.

The lack of change in the pediatric health care providers’ comfort level is not surprising. Improving a physician’s comfort with a topic, particularly ones as complex as DV, requires far more than 2 hours of education. However, the significant relationship between comfort level and routine screening implies that improved comfort should be one of the key goals of a DV training session. Interestingly, though the survey respondents had a strong knowledge base in the issues of DV, this did not result in perceived comfort or competence in the topic of DV. The difficulty in changing physician comfort related to DV has been documented previously.15

Of the 46% (16/35) of pediatric health care providers who attended both educational sessions and reported screening for the presence of DV during more than half of their well-child visits, 66% (23/35) reported that they had identified at least 1 case of DV in the prior 6 months. Forty-eight percent (11/23) had identified 1 case, 43% (10/23) had identified between 2 and 4 cases, and 9% (2/23) had identified more than 10 cases. If the average resident provides primary care to 6 children each week, each resident would care for just over 150 patients in the course of 6 months. If the prevalence of DV is estimated to be 35% and each resident screened for DV during half of their well-child visits, one would expect that each resident would identify more than 20 cases of DV over a 6-month period. There are several explanations for why this was not observed. Many women do not admit to current or past DV the first time they are asked about it, so although the pediatric health care providers may have asked, they may have received a false-negative response. It may also be related to interpretation of the survey question. Respondents may have interpreted the word “identified” to mean that they were the first person with whom the DV victim had discussed DV. Using this definition, identification of DV in a woman who had already revealed the information to another person would not count as a case of DV. Informal questioning of several faculty and residents confirmed this hypothesis and revealed that they would have answered the question differently if asked how many cases they became “aware of” during the prior 6 months. It is also possible that if pediatric health care providers were not screening as frequently as they reported, they would be expected to identify fewer cases. The confounding effect of the patients on identification of DV victims cannot be overlooked. Because of the changes that were made in the clinic as part of this program, patients saw DV posters on the walls of the waiting room and saw signs every time they used a bathroom near the clinic. This may have increased the number of patients who were willing to discuss the topic of DV with their physician, thus helping to increase the number of identified cases of DV.

Since the postintervention survey was administered only 3 months after the second educational session, it is possible that the changes in screening practice were only transient. However, had we waited longer to complete the follow-up survey, the possibility of the pediatric health care providers receiving DV information from other sources would have increased, thus decreasing the ability to directly correlate attendance at training sessions and changes in practice. In particular, 1 month after the pediatric health care providers completed the second survey, the newly formed Collaborative Domestic Violence Working Group at CHP presented a grand rounds that focused on many of the same issues as in the educational sessions. Since many of the pediatric health care providers in this study attend grand rounds, a survey given subsequent to it would be unable to discriminate whether the grand rounds or our intervention had been the cause of any changes. To decrease the possibility that the change in screening practices will be transient, the educational module described in this article will be integrated into the residency program. As a result, there will never be more than a 6-month period without some type of resident or faculty DV education. Since the staff members are stable and have attended the DV training sessions, we hypothesize that when they precept residents, they will prompt residents to screen for DV. We also plan to provide similar training to the community preceptors and residents with the goal of improving DV screening in the community.

Accepted for publication April 11, 2002.

This study was supported in part by an Administration Faculty Development Grant in General Pediatrics, D-DO8-HP-50102-03-01, from the Human Resources Services, Bethesda, Md (Dr Berger).

We thank the following people for designing and implementing the 90-minute teaching session described in this article: Kate DeAntonis, MD, Sara Hamel, MD, Dianna Ploof, EdD, Julie Spangler, RN, Tahniat Syed, MD, Janet Syphan, BS, Joan Williams, MSW, and Barbara Williams, MSW. We would also like to thank Frank D’Amico, PhD, and Lorraine Ettarl, MPH, for their statistical advice and expertise, Lorraine Douthett for her administrative assistance, Deb Moss, MD, for her review of the manuscript, and Heidi Feldman, MD, PhD, for her support of the project.
REFERENCES