NURSES IN FAMILY PEDIATRIC PRACTICES: A SURVEY OF THE HEALTH PROTECTION AGENCY OF THE METROPOLITAN CITY OF MILAN

Abstract

Purpose:

Primary pediatric care in Italy is guaranteed by family pediatricians, who may have their own private offices or work in group clinics that also have nurses/pediatric nurses in order to enrich their offer of services. The aim of this study was to investigate the activities of nurses working in pediatric practices in order to identify and classify the nursing healthcare services offered by the practices themselves.

Design and study:

An observational study was conducted including nurses working in the pediatricians' offices who voluntarily agreed to undergo a semi-structured interview. The investigated variables were individual, institutional and organisational. The study sample consisted of 22 nurses with a mean age of 39 ± 13.3 years, 16 of whom were pediatric nurses.

Results:

All of the nurses stated that they had not received suitable training for working outside a hospital, and that they carried out educational, diagnostic/therapeutic, and bureaucratic administrative/support activities. Nine of the nurses working in group pediatric clinics carried out educational activities autonomously, something that the nurses working in individual or associated clinics did not perform. Twenty of the interviewees also provided telephone consultancy, and 11 of the clinics used algorithms as guides.

Conclusions/Practice implications:

The findings of this study underline the potential of developing the nursing profession at community level. Further studies are desirable in order to extend the investigation of the pediatric nurses' activities implemented at community level in other Italian provinces.

Keywords: nurse, primary pediatric care, pediatric patient care

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PROTECTION AGENCY OF THE METROPOLITAN CITY OF MILAN**

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1 NURSES IN FAMILY PEDIATRIC PRACTICES: A SURVEY OF THE HEALTH 2 PROTECTION AGENCY OF THE METROPOLITAN CITY OF MILAN

3 PURPOSE

4 As indicated in the European Health Report 2012, the significant demographic and epidemiological
5 changes that have taken place over the last few decades have unequivocally highlighted the need to
6 promote health, prevent diseases and provide more than simple healthcare (The European Health
7 Report 2012: Charting the way to well-being, 2012). The widely documented reduction in the
8 duration of hospitalization, early discharges, the increased incidence of chronic degenerative
9 diseases also in the pediatric setting and the adverse effects of hospitalization on children and their
10 families all underline the need to review healthcare models and redefine the responsibilities of local
11 healthcare professionals (Document of the Conference of Regions. The White Book on children's
12 health 2011, 2012). One solution may be to implement primary healthcare measures aimed at
13 actively promoting health and strengthening personal resources such as self-care and family
14 learning and individually accessible social resources, particularly in the case of people affected by
15 chronic diseases or disabilities (Il sistema delle cure primarie, 2010). In this context, the decisive
16 role of nurses is widely supported in various international and European directives, including the
17 "Health for All" project of the World Health Organization (Asvall, 2000), as well as several
18 published scientific studies (Rocco et al., 2017; Martínez-González et al., 2015) whose findings
19 suggest that appropriately trained nurses are capable of obtaining primary care results that are as
20 good as those achieved by physicians, or even better in certain investigated areas. A recent review
21 by Laurant and colleagues (Laurant et al., 2018) has demonstrated that nurse-led primary care
22 resulted in a higher satisfaction level compared to doctor-led practice. The same improvement was
23 found regarding chronic patients' health status (i.e., blood pressure control, chronic pain in
24 rheumatological patients). Moreover, nurse-led primary care was found to offer a longer
25 consultation time and to promote the patient's compliance, resulting in a higher attendance of return
26 visits.

However, despite considerable efforts in standardizing nurses' education in different settings, the variety of regulatory bodies of each country and the broad significance of Advanced Practice Nurse (APN) and Advanced Paediatric Nurse Practitioners (APNPs), undermines the creation of a globally acknowledged APN's scope of practice (Kooienga & Carryer, 2015).

The organization of primary pediatric care in Europe varies from country to country, but pediatricians are generally considered second-level specialists. In Italy, pediatric care is guaranteed by family pediatricians, who represent a primary national resource for protecting children and adolescents' health. Every Italian child has a right to treatment by a specialist National Health Service pediatrician from birth until the age of 14 years (16 in the case of chronic disease or particularly delicate clinical conditions). It is compulsory to have children followed by a pediatrician up to the age of six years, whereas parents can choose to have their children aged 7-14 (or 16) years followed by a pediatrician or general practitioner (Marinello & Scarazatti, 2011).

In addition to solo practices, pediatric healthcare's local organization also increasingly involves various associative forms as described in the National Collective Agreement of 2000 (Accordo Collettivo Nazionale per la disciplina dei rapporti con i medici specialistici Pediatri di libera scelta, 2000) which have been divided in pediatric group practices, associations, and networks. These now account for 60% of practices and are an essential and innovative means of providing higher service levels and facilitating citizen/pediatrician relationships (Le cure primarie nel nuovo assetto organizzativo e funzionale del SSN, 2013; Regolamento concernente l'individuazione della figura e del relativo profilo professionale dell'Infermiere, 1994) as, in addition to administrative/bureaucratic personnel, also involve the collaboration of nurses/pediatric nurses who can enrich the services offered by a clinic and improve the quality and accessibility of primary pediatric care (Accordo Collettivo Nazionale per la disciplina dei rapporti con i medici specialistici Pediatri di libera scelta, 1999).

A multicentre study by Van Esso (Van Esso et al., 2010) has explored differences in pediatric primary care across Europe: 64% of the pediatric clinics included in the survey were staffed by a

median of one nurse for every pediatrician or general practitioner (with a range from 1 to 7). A study conducted in Denmark highlighted the role of APNPs in promoting holistic and family-centered practice through educational interventions (Würtz et al., 2019) while research within a Spanish setting, demonstrated the usefulness of algorithms for nurse care management of children with acute minor illnesses in primary care (Fabrellas et al., 2015). However, nurses' working activities and beneficial role within the primary care system, although widely investigated in the other European countries, have been poorly explored within the Italian setting. This study aimed to investigate the working activities of these nurses in order to identify and classify the nursing care provided by the clinics in which they work.

DESIGN AND METHODS

The institutional review board of the Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milano, approved the study.

Setting

The study involved the individual or associative practices of primary care pediatricians registered with the Health Protection Agency of the Metropolitan City of Milan.

Inclusion criteria

The study population consisted of nurses/pediatric nurses working in the practices of primary care pediatricians.

Exclusion criteria

The pediatricians themselves and any other professionals (i.e., physiotherapists, secretaries, psychologists) working in the same practices.

Method

All primary care practices registered with the Health Protection Agency of the Metropolitan City of Milan were contacted and asked whether a nurse or pediatric nurse was employed in the practices. Subsequently, the nurses were asked to take part in the study. As participation was voluntary, the project was described to the nurses who were asked to consent to the interviews under the guarantee

of anonymity. Nurses who agreed to participate attended semi-structured interviews conducted in their place of work, in August and September 2018.

Each interview lasted around 30 minutes, was conducted by the same researcher, recorded and transcribed. The questionnaire was divided into two parts: the first part consisted of 5 close-ended questions regarding the essential characteristic of the practice (i.e., associative or individual study, number of nurses working in the practice, number of children followed), and 7 close-ended questions regarding nurses' basic characteristics (i.e., age, sex, degrees acquired, years of experience). The second part consisted of 3 open-ended questions aimed at investigating: modalities of integration in the practice's staff, list and description of activities performed in the practice by the nurse, personal considerations regarding the appropriateness of the received training or educational background.

The investigated variables were divided into 3 categories, according to the topic addressed:

Institutional variables (relating to the surgery/clinic): the number of pediatricians and nurses/pediatric nurses; the type of practice (individual practice, group practice including two or more pediatricians working in a single location, associative practice including two or more pediatricians working in practices located throughout the territory but coordinating the opening hours of their practices to ensure greater availability of access to patients); and the number, age and ethnicity of the children followed;

Individual variables (relating to the nurses): socio-demographic characteristics; basic and subsequent training; length of service in the practice; type of contract; previous working experiences.

Organizational variables (relating to the activities carried out): the type of involvement and the activities carried out.

The organizational variables were divided into educational and technical macro-areas in line with the specific areas of intervention of nurses and pediatric nurses laid down in Art. 1, comma 2, of Ministerial Decrees No. 739/1994 and 70/1997 (Regolamento concernente l'individuazione

105 della figura e del relativo profilo professionale dell'Infermiere, 1994; Regolamento concernente
106 l'individuazione della figura e del relativo profilo professionale dell'Infermiere pediatrico, 2006).
107 The educational interventions were further subdivided into activities of primary, secondary or
108 tertiary prevention following the definition of the "Istituto Superiore della Sanità." Primary
109 prevention aims to improve the overall health of the population; secondary prevention aims to
110 detect a disease early or timely while tertiary prevention aims to reduce symptoms of the disease
111 and improve quality of life (Rare Diseases Prevention, 2014). Any response not falling into one of
112 the two macro-areas was recorded as "bureaucratic administrative/support activities."

113 *Data analysis*

114 The data were analyzed descriptively, with the continuous variables being recorded as mean values
115 $\pm$ standard deviation (SD) and ranges, and the discrete variables as percentages.

116 RESULTS

117 Out of the 424 primary care pediatricians registered with the Health Protection Agency of the
118 Metropolitan City of Milan, only 40 employed nurses in the practice. The total number of nurses
119 employed in these 40 practices was 28. All of them were contacted to participate in the study: 22
120 nurses were enrolled, whereas 6 declined to participate.

121 *Institutional variables*

122 Three nurses (14%) worked in three solo practices (three pediatricians); nine (41%) in three group
123 practices (14 pediatricians), ten (45%) in six associative practices (15 pediatricians)

124 The mean number of children followed by the investigated practices was 1093.3 ± 194 . Each child
125 was clinically followed by the pediatrician, whose work was supported by the nurse. No nurse
126 stated to be exclusively in charge of any patient.

127 Fifteen of the interviewed nurses (68%) stated they saw children with various ethnic origins,
128 and only seven (32%) that they mainly saw Italian children.

129 *Individual variables*

130 The study sample consisted entirely of women with a mean age of 39 ± 13.3 years; 16 (73%)

131 were pediatric nurses. Twelve nurses (55%) had a regional diploma, and 10 (45%) a university
132 degree. Irrespectively from the pre-service education received, all of the nurses stated that they had
133 not received adequate basic training for working outside a hospital, but hardly any of them had
134 attended further training courses.

135 All the enrolled nurses said they had been taken on as self-employed professionals. Fourteen
136 (64%) stated that they had not received any organized help in beginning their jobs; the
137 remaining eight (36%) were supported by another nurse for periods ranging from one week to
138 one month.

139 In table 1 are shown the nurses' length of service in their current workplaces. The majority of
140 nurses had been working in their current workplaces for less than 6 years.

141

Years of experience in the practice		
Length of service	%	No.
<1	31	7
1-5	41	9
6-10	14	3
>10	14	3

145 Table 1: Nurses' length of service in their current workplaces

146
147 Moreover, fifteen nurses (68%) had the previous working experience: six (40%) had worked in a
148 hospital, two (13%) in the community setting, and seven (47%) in both. The hospital activities
149 were primarily carried out in a pediatric setting, and 11 in this group (73%) had worked for
150 more than 11 years.

151 *Organizational variables*

152 The nursing services offered by the practices were both of educational and technical nature.

153 The nurses also carried out bureaucratic administrative or support activities, depending on
154 the type of practice.

155 *Educational interventions*

156 The nurses stated that the primary aims of their educational activities were to promote and

157 preserve the children's health through primary, secondary, and tertiary interventions.

158 Table 2 shows their educational primary preventive interventions by type of practice.

159

<i>Nurses that declared to be in charge of the topic</i>			
<i>Type of Practice</i>	Exclusive or complementary breastfeeding	Prevention of most common childhood diseases (i.e., respiratory tract infections)	Parental training courses
Solo practices' nurses	3 (100%)	2 (67%)	0 (0%)
Group practices' nurse	8 (89)%	4 (44%)	2 (22%)
Associative practices' nurses	8 (80%)	5 (50%)	1 (10%)
Total of interviewed nurses	19 (86%)	16 (73%)	3 (14%)

160
161 Table 2: Educational interventions by type of practice. Results are listed as the number (percentage) of
162 nurses who declared to be in charge of the topic as an educational activity.

163
164 The only secondary preventive intervention was hearing screening through a parental questionnaire,
165 which was administered by four (44%) nurses working in group practices and three (30%) nurses
166 working in associative practices. In table 3 are shown the 6 tertiary preventive interventions
167 performed by nurses, by type of practice.

168

<i>Nurses that declared to be in charge of the topic</i>						
<i>Type of Practice</i>	Nasal washes	Management of feverish children	Management of cough and sore throat	Management of vomiting and diarrhea	Management of exanthematous diseases	Management of conjunctivitis
Solo practices' nurses	1 (33%)	3 (100%)	3 (100%)	3 (100%)	3 (100%)	3 (100%)
Group practices' nurse	8 (89%)	8 (89%)	9 (100%)	9 (100%)	8 (89%)	8 (89%)
Associative practices' nurses	9 (90%)	9 (90%)	9 (90%)	9 (90%)	9 (90%)	9 (90%)
Total of interviewed nurses	18 (82%)	20 (91%)	21 (95%)	21 (95%)	20 (91%)	20 (91%)

169 Table 3: Tertiary preventive educational activity by type of practice. Results are listed as the number (percentage)
 170 of nurses that declared to be in charge of the topic as a preventive educational activity.

171
 172 All the nurses working in group practices said that they autonomously carried out
 173 the educational activities shown in Table 4, whereas the nurses working in the seven
 174 individual practice's or associative practices did not do.

175 .

<i>Educational activity</i>	Total of interviewed nurses	<i>Solo practices</i>		<i>Group practices</i>		<i>Associative practices</i>	
		<i>Perform ed with doctor</i>	<i>Perfor med autonomously</i>	<i>Performed with doctor</i>	<i>Performed autonomously</i>	<i>Performed with doctor</i>	<i>Performed autonomously</i>
Exclusive and complementary breastfeeding	19 (86%)	3 (100%)	0 (0%)	0 (0%)	8 (89%)	8 (80%)	0 (0%)
Prevention of most common childhood diseases (i.e., respiratory tract infections)	16 (73%)	2 (67%)	0 (0%)	0 (0%)	4 (44%)	5 (50%)	0 (0%)
Parental training courses	3 (14%)	0 (0%)	0 (0%)	0 (0%)	2 (22%)	1 (10%)	0 (0%)
Education concerning nasal washes	18 (82%)	1 (33%)	0 (0%)	0 (0%)	8 (89%)	9 (90%)	0 (0%)

176 Table 4: Educational activities performed by nurses according to the type of practice. Results are listed as the
 177 number (percentage) of nurses that declared to be in charge of the topic autonomously or in collaboration
 178 with the doctor.

179
 180 In carrying out their tertiary preventive activities, 20 (91%) of the interviewed nurses also
 181 gave telephone advice regarding the management of typical children's issues, such as fever, cough,
 182 vomiting, and diarrhea. Eleven (55%) of the practices use algorithms as a guide to ensure that
 183 telephone calls are handled in a comprehensive and organized manner.
 184 Only six (30%) of the nurses giving telephone advice specified that they had been previously
 185 trained to do so and that their previous working experience had undoubtedly helped them to learn

186 how to do it.

187 *Technical interventions*

188 The nurses also stated that they carried out the diagnostic/therapeutic activities listed in
189 Tables 5 and 6.

Activity	Total	Solo practices	Group practices	Associative practices
Measuring anthropometric parameters	21 (95%)	3 (100%)	9 (100%)	9 (90%)
Measuring vital signs	20 (91%)	3 (100%)	8 (89%)	9 (90%)
Level 1 investigations - (simple self-help) ^a	22 (100%)	3 (100%)	9 (100%)	10 (100%)
Electrocardiogram	2 (9%)	0 (0%)	2 (22%)	0 (0%)

190 ^aLevel 1 investigations = pharyngeal swabs, hemochrome, C-reactive Protein,(PCR) , glycemia, urine stick.

191 Table 5: Diagnostic activities

Activity	Total	Solo practices	Group practices	Associative practices
Vaccinations	13(59%)	2 (67%)	7 (78%)	4 (40%)
Intramuscular drug administration	17 (77%)	2 (67%)	9 (100%)	6 (60%)
Dressings	15 (68%)	1 (33%)	9 (100%)	5 (50%)
Removing sutures	13 (59%)	1 (33%)	8 (89%)	4 (40%)

193 Table 6: Therapeutic activities

196 Three (14%) of the nurses working in group practices followed the progress of the children with
197 chronic conditions autonomously, by measuring the vital and anthropometric parameters
198 and carrying out educational activities.

199 Finally, Table 7 shows the bureaucratic administrative/support activities carried out in the
200 different types of practices.

Activity	Total	Solo practices	Group practices	Associative practices
Opening/closing practice	10 (45%)	3 (100%)	1 (11%)	6 (60%)
Distributing certificates/prescriptions	7 (32%)	2 (67%)	2 (22%)	3 (30%)
Invoicing	2 (9%)	1 (33%)	1 (11%)	0 (0%)

Managing appointments	10 (45%)	3 (100%)	2 (22%)	5 (50%)
Computer management	17 (77%)	3 (100%)	6 (67%)	8 (80%)
Waiting room management	11 (50%)	3 (100%)	2 (22%)	6 (60%)
Receiving telephone calls	7 (32%)	3 (100%)	0 (0%)	4 (40%)
Printing information materials	11 (50%)	2 (67%)	5 (55%)	4 (40%)
Checking expiry dates of drugs/devices	20 (91%)	3 (100%)	9 (100%)	8 (80%)
Material supplies	18 (82%)	3 (100%)	9 (100%)	6 (60%)
Managing special waste	15 (68%)	2 (67%)	8 (89%)	5 (50%)

Table 7: Bureaucratic administrative/support activities.

DISCUSSION

The results provide a clear and exhaustive description of nurses' activities, and show that the areas covered are in line with their professional profile, (Regolamento concernente l'individuazione della figura e del relativo profilo professionale dell'Infermiere, 1994; Regolamento concernente l'individuazione della figura e del relativo profilo professionale dell'Infermiere pediatrico, 2006) the deontological code (Code of ethics of the nurse, 2009) and other published findings (Bauer & Bodenheimer, 2017). The role of primary care nurses is commonly linked to areas of education and inter-relationships, aimed at promoting healthy lifestyles and the treatment compliance of patients with chronic diseases (Bauer & Bodenheimer, 2017). However, our study of pediatric practices, demonstrated that their purpose is not limited to promoting the health of children and their families by dealing with matters concerning disease management and prevention. In fact, they also have a proactive and autonomous role in performing diagnostic and therapeutic activities.

However, the realities of working in pediatric practices are even more varied, and working in smaller contexts in which there are few pediatricians (if not only one) may give rise to some issues. In fact, there is a difference between nurses' responses regarding educational interventions autonomously performed (table 4) and therapeutic activities (table 6) in individual and group practices, with the latter being more involved in these tasks. The activities of a practice depend on its organizational structure, and it could be speculated that the higher prevalence of bureaucratic

administrative/support activities in solo practices (Table 7), may pose a barrier to nurses' more
 advanced and proactive role (Wilson et al., 2002).

Group practices allow nurses to carry out professional activities autonomously and develop new
 organizational initiatives. They are more likely to underline the role of collaboration and the sub-
 division of healthcare activities, thus allowing nurses to make the most of their professional skills,
 training, and career prospects. A shared vision and teamwork make it possible to establish and
 maintain collaborative relationships between pediatricians and nurses, as has also been pointed out
 by Hamel and Vossing (Hämel & Vössing, 2017).

Two studies carried out in Catalonia have shown that nurses can autonomously manage minor
 pathological conditions. One found that 75.6% of 54,379 consultations involving pediatric patients
 led to the successful resolution of minor diseases and low reoccurrence rates during the following
 seven days (Fabrellas et al., 2011). The other (Fabrellas et al., 2015) was an observational study of
 467,160 unscheduled nursing consultations involving children with minor diseases were
 successfully resolved in 65.4% of cases; the remaining 34.6% were referred to a pediatrician based
 on the nurses' evaluation. These results show the feasibility of using algorithms and close
 collaboration between physicians and nurses and highlight the effectiveness of nurse-led patient
 management. In our study, only 55% of nurses used algorithms to evaluate patients during
 telephone calls and decided whether to refer them to the doctor. Despite the majority of nurses
 (91%) indicated they provided advice on minor children's illnesses, only 30% stated to have
 received specific training to give telephone advice or felt that their previous clinical experience was
 sufficient to enable them to provide clinical advice.

Nevertheless, within our context, it has to be taken into account that there are no predefined
 algorithms or structured tabs for pediatric nurses working in primary care in Italy. Moreover,
 according to our national law (Regolamento concernente l'individuazione
 della figura e del relativo profilo professionale dell'Infermiere, 1994), pediatric nurses are not
 allowed for independent clinical intervention to manage children's illnesses. Any decision or final

248 evaluation of the patient, including general examination, diagnosis, and therapeutic prescription,
249 should be performed by the doctor, leaving only a supportive role for nurses in clinical or
250 therapeutic decisions.

251 Horrocks and Creazzo have also found that professional specialization (73% of our
252 interviewees were pediatric nurses) or previous experience of working in a hospital
253 (mainly a pediatric hospital) are capable of guaranteeing that children and adolescents are
254 provided with appropriate healthcare services (Horrocks et al., 2002; Creazzo & Vagliano, 2012).

255 As in the case of previously reported studies, (Dierick-van Daele et al., 2009; Fabrellas et al., 2011)
256 we found that even telephone consultations concerning health problems seem to valorize
257 professional specificity. Moreover, nurses reported using algorithms developed in collaboration
258 with a pediatrician during telephone consultations in 55% of the present study's practices. Within
259 this context, it can be therefore speculated that the associated use of algorithms might represent an
260 additional tool in guiding nurses when defining the need for an urgent or programmed visit, giving
261 advice, or ensuring an appropriate follow-up.

262 However, our interviews also highlighted some critical factors concerning the basic training
263 received by nurses. Regardless of their background or type of education (a regional
264 diploma or university degree), all the interviewed nurses stated they had not received adequate basic
265 training for working outside a hospital. Nearly any of them had attended further training courses.
266 These results indicate the need for implementing further specific training.

267 Various published articles (Horrocks et al., 2002; Thomas & Laurie, 2016) have suggested that
268 providing specific training aimed at integrating nursing knowledge and skills in the primary care
269 setting seems to be a priority. They all agree that there is a need to create specific primary care
270 training courses for nurses and, undefined nature of such training, that these should be based on
271 shared protocols (Hämel & Vössing, 2017; Bauer & Bodenheimer, 2017) in order to guarantee the
272 safety and efficacy of nursing interventions (Norful et al., 2017) and also reduce the number of

273 requests for subsequent further action on the part of surgical centers and clinics (Fabrellas et al.,
274 2015).

275 PRACTICE IMPLICATIONS

276 The findings of this study underline the potential of developing the nursing profession at the
277 community level. By highlighting the need of an adequate basic training, nurses could request and
278 benefit from optional college classes or post-graduate courses organized by national or local nursing
279 associations. Moreover, nursing organizations could draft and discuss standards of practice, to
280 create shared operational guidelines to which primary care nurses can refer, as already done in
281 hospital settings.

282 In order to make the most of their professional skills, nurses are entitled to have a proactive and
283 autonomous role in performing educational, diagnostic and therapeutic activities. To encourage
284 these changes, a more structured primary-care oriented education and training would enable nurses
285 who choose to work in these settings to seek out employment opportunities that enable more
286 autonomy and independence in their role and practice collaboration.

287 LIMITATIONS

288 The limitations of this study are attributable to the small sample size and the fact that it
289 was restricted to the Health Protection Agency of the Metropolitan City of Milan, which
290 means that the findings cannot be generalized to what nurses may do in other primary care
291 pediatric settings.

292 CONCLUSION

293 The present study results allow for a better understanding of the nurses' working activities within
294 the primary care system. Further studies are desirable to extend the investigation of the pediatric
295 nurses' activities implemented at the community level.

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List of abbreviations:

PCR = C-reactive Protein

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Ethics approval and consent to participate

Protocol was approved by the institutional Ethics Committee of the Fondazione Istituto di

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Informed written consent was obtained from the participants before enrolment.

Data statement: Due to the sensitive nature of the questions asked in this study, survey respondents were assured that raw data would remain confidential and would not be shared.

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