



## ***Real-Life Contexts of Spontaneous Family Life Education*** ***Rzeczywiste konteksty spontanicznej edukacji*** ***w zakresie życia rodzinnego***

### **ABSTRACT**

---

**RESEARCH OBJECTIVE:** The aim of the research is to explore how spontaneous family life education and preparation for adult life takes place in students' immediate environment in Hungary.

---

**THE RESEARCH PROBLEM AND METHODS:** Our main research question is "what are teachers' and support professionals' perceptions of patterns of family life education in different family milieus?" The target group for the individual and focus group interviews was teachers working with grades 5–13 and school support staff (N = 53).

---

**THE PROCESS OF ARGUMENTATION:** The theoretical basis of enhancing family life has undergone considerable change in recent decades. Several international studies have addressed the extreme context sensitivity of family and adult life education in societies with significant regional and social inequalities, such as Hungary, and have called for the compilation of a problem map on which adult life education is based.

---

**RESEARCH RESULTS:** One important finding of the study is that spontaneous family life education in Hungarian families varies widely according to social and regional aspects. Four family models emerged from the analysis (rural low status, rural or small-town strivers, urban middle class, and urban educated high status).

---

**CONCLUSIONS, RECOMMENDATIONS AND APPLICABLE VALUE OF RESEARCH:** Preparation for various aspects of adult life is a challenging school task that requires special preparation

and extra work by teachers and school support staff. Because of the dialogue between spontaneous family life education and family life education in schools, there is no uniform curriculum and method for family life education that can be used in all social contexts.

→ **KEYWORDS**     **FAMILY LIFE EDUCATION, FAMILY MILIEUS, TEACHERS, SCHOOL SOCIAL WORKERS, SCHOOL COUNSELLORS**

## STRESZCZENIE

**CEL NAUKOWY:** Celem badań jest ustalenie, w jaki sposób spontaniczna edukacja w zakresie życia rodzinnego i przygotowanie do dorosłego życia odbywa się w bezpośrednim otoczeniu uczniów na Węgrzech.

**PROBLEM I METODY BADAWCZE:** Nasze główne pytanie badawcze brzmi: Jak nauczyciele i specjaliści ds. wsparcia postrzegają wzorce edukacji rodzinnej w różnych środowiskach rodzinnych? Grupą docelową wywiadów indywidualnych i zogniskowanych wywiadów grupowych są nauczyciele pracujący z klasami 5–13 i personel pomocniczy szkoły (N = 53).

**PROCES WYWODU:** Teoretyczne podstawy poprawy życia rodzinnego uległy znacznym zmianom w ostatnich dziesięcioleciach. W kilku międzynarodowych badaniach zwrócono uwagę na wyjątkową wrażliwość kontekstową edukacji rodzinnej i edukacji dorosłych w społeczeństwach o znacznych nierównościach regionalnych i społecznych, takich jak Węgry, i wezwano do opracowania mapy problemów, na której opiera się edukacja dorosłych.

**WYNIKI ANALIZY NAUKOWEJ:** Jednym z ważnych wniosków płynących z badania wywiadów jest to, że spontaniczna edukacja rodzinna w węgierskich rodzinach jest bardzo zróżnicowana pod względem społecznym i regionalnym. Z analizy wyłoniły się cztery grupy modeli rodzinnych (wiejski niski status, wiejscy lub małomiasteczkowi stratedzy, miejska klasa średnia, miejski wykształcony wysoki status).

**WNIOSKI, REKOMENDACJE I APLIKACYJNE ZNACZENIE WPŁYWU BADAŃ:** Przygotowanie do różnych aspektów dorosłego życia jest trudnym zadaniem szkolnym, które wymaga specjalnego przygotowania i dodatkowej pracy ze strony nauczycieli i personelu pomocniczego szkoły. Ze względu na dialog między spontaniczną edukacją na temat życia rodzinnego a edukacją na temat życia rodzinnego w szkołach nie ma jednolitego programu nauczania i metody edukacji na temat życia rodzinnego, które mogłyby być stosowane we wszystkich kontekstach społecznych.

→ **SŁOWA KLUCZOWE**     **EDUKACJA NA RZECZ ŻYCIA RODZINNEGO, ŚRODOWISKA RODZINNE, NAUCZYCIELE, SZKOLNI PRACOWNICY SOCJALNI, PEDAGODZY SZKOLNI**

## Introduction

In recent years, the concepts of family life, marriage, and family have diversified, fertility and marriage rates have declined, and the number of divorces and single-parent households have increased (Ulferts, 2020). There is a high proportion of ethnically and culturally mixed families, where some of the complex and sensitive issues of family life education tend to be avoided, as they can easily lead to cultural conflicts (Buehler, 2020). The functioning of traditional extended families, local communities, and nuclear families is also challenged by rapid social and geographical mobility (Dafinou et al., 2022). Hungary has one of the highest rates of births to teenage mothers in Europe (7%), who are largely single (Makay, 2019); moreover, two fifths of women are abused in their relationships (Tóth, 2018) and the country ranks tenth regarding the proportion of children at risk of poverty or social exclusion (European Court, 2020).

One of the consequences of all this is that new generations have become less confident in their views on family life and adult life management. Schools must be involved in providing professional support and prevention. Preparation for independent adult life, family life education, and life skills are part of the public education curriculum all over the world; since 2020, family life education has been among the key development tasks of the new National Core Curriculum in Hungary (Engler et al., 2020). Its aim is to prepare school-age pupils for independent adult life, responsible relationships, and to start a family.

There is general agreement among researchers on the subject that the introduction of family life education programs requires caution. Family life education planning starts with problem analysis and the definition of the program's overall goal (Duncan & Goddard, 2016). It is reiterated in the international literature that family and adult life education programs can only be developed with contextual knowledge, because their effectiveness depends on their relevance. While research on family life education often focuses on the psychological hardships that families face (e.g. Myers-Walls, 2020), it rarely takes into account the structural, geographical, and social diversity of families, which has a significant impact on their culture, values, attitudes, and capabilities.

Several authors address the extreme context sensitivity of family life education (Myers-Walls, 2000; Ballard & Taylor, 2011; Darling et al., 2022), specifically, the fact that there is a great need to educate clients and partners about culturally identical family life, in terms of both content and methodology, and that this approach must be given importance in planning and implementation. In different cultures, the practice and content of family life education can be quite different. In addition to the diversity of families according to religion/culture, language, social status, region and settlement, the diverse structures within the same cultures must also be taken into account. Therefore, in the daily practice of education for family life, the professional teacher must carefully decide what to teach and how to teach it, even when choosing between procedures and teaching materials proven by research. In other words, in addition to being evidence-based, sociocultural relevance is an important principle of education for modern family life (Ballard & Taylor, 2011). One of the most authoritative handbooks on family life education, for

example, lists the specific solutions for family life education in many contexts. It devotes separate chapters to those living in rural areas and different minority groups, discussed separately according to language and culture (Asian, Arab, Latin American, and African American families), to children being raised by grandparents, to children of prisoners and detainees, etc. (Ballard & Taylor, 2011). The authors also emphasize that, based on the intersectional characteristics, the methodology of family life education can be divided into further intersectional types, i.e. students from certain families can be categorized several ways. It is an important and recurring idea that, when considering sociocultural diversity in the implementation of education for family life, it is important not only to consider what unique difficulties and problems can be identified in the specific setting, but also to discover what strengths the families of the pupils in question have (Myers-Walls, 2000). Thus, accounting for geographical and social diversity is inevitable in this respect (Demo & Acock, 1993; Wiley & Ebata, 2004; Mancini et al., 2020). In Hungary, there is a high degree of diversity in social status and place of residence among parents of young school-age children (Pusztai & Csók, 2023). Socioeconomic status and family stability are the most favorable in urban areas and the worst in rural areas.

International research exploring the views of educators suggests that without knowledge of family realities and parental involvement, the education of students for family and adult life cannot be achieved (Oz, 1991; Plaza-del-Pino et al., 2021; Varani-Norton, 2014; Yildirim, 2019). The experience of teachers and school support staff in family education can be well utilized in the implementation process. In this paper, we review how spontaneous family life education is taking place in students' families. Spontaneous family life education is defined as a process whereby students, growing up in their own families, experience patterns of spousal and parental role fulfilment and practices of managing human and material resources within the family. The main research question of our study is "what are teachers' and support professionals' perceptions of patterns of family life education in different family milieus?" In order to answer this question, we recorded 53 interviews and processed the interview texts using open coding. Below, we present the methods of the interview research, followed by the main results of the analysis.

## Research Tools (Methods)

The target group of the research was class teachers and subject teachers in grades 5–13, as well as school support staff (school social workers and counsellors). In the international literature we reviewed, which examined existing systems of family and adult life education in terms of teachers' perceptions, we almost without exception found qualitative research based on individual and focus group interviews. In light of this, the research team opted for the same instruments and processing procedures. The measurement instrument was designed following the logic we had encountered in the international literature on the subject (Darling et al., 2022; Duncan & Goddard, 2016). The first major content unit of both the class teacher interviews and the focus group interviews

with teachers and school support staff included the presentation of their schools, complemented by a problem map pertaining to the spontaneous family life education of students belonging to the respective school units.

The interviews took place in spring 2022. The areas we chose to include in the research were the three most disadvantaged counties in Hungary with the highest proportion of low-status, disadvantaged pupils (Borsod-Abaúj-Zemplén county, Hajdú-Bihar county, and Szabolcs-Szatmár-Bereg county). Quotas were set for the selection of respondents according to county, school type, school provider, and career stage; then, taking the quotas into account, interviewees were invited by means of snowball sampling. Ten teachers with experience as class teachers were interviewed individually, a further 39 subject teachers were interviewed in seven focus groups, and four school support staff members were interviewed in one focus group (N = 53).

The texts were transcribed and the data was subjected to thematic analysis. Spontaneous family life education was a separate thematic unit that underwent inductive coding. We created types according to the problems mentioned in each family background. We used qualitative interpretive phenomenological analysis. In addition to triangulation within the qualitative method, validity was also ensured by the fact that different researchers processed the data in successive stages of open coding; in other words, investigator triangulation made it possible to minimize the biasing effect of subjectivity. The composition of respondents is summarized in the tables below.

Table 1. Demographic and Professional Data of Class Teacher Interviewees (Number of Persons)

Gender	Career stage	Grade level	School type
female: 8	early career: 2	upper primary: 4	state-run primary school: 2
	>5 years in the profession: 1	secondary: 6	church-run primary school: 2
male: 2	>10 years in the profession: 2		state secondary grammar school: 2
	>20 years in the profession: 4		state secondary vocational school: 3
	nearly 30 years in the profession: 1		state technical college: 1

Own source.

Table 2. Demographic and Professional Data of Focus Group Interviewees (Number of Persons)

Gender	Career stage	School type
female: 35	early career: 4	state primary school: 3
	>5 years in the profession: 6	church primary school: 5
male: 8	>10 years in the profession: 10	state primary-level art school: 1
	>20 years in the profession: 15	church primary and secondary grammar school: 5
	>30 years in the profession: 7	foundational primary and secondary grammar school: 3
	>40 years in the profession: 1	state secondary grammar school: 6
		church secondary grammar school: 6
		state secondary grammar school and technical college: 2
	church secondary grammar school and technical college: 1	
	state vocational institution: 3	
	state technical college: 7	
	church technical college: 1	

Own source.

## Analysis of the Interviews

The school professionals who were interviewed worked with students from fundamentally different family backgrounds, and their responses reflected a varied picture of spontaneous family life education in homes. Based on the responses, we were able to construct a school typology in terms of social composition and then to summarize the experiences of teachers and support staff about the family models that belonged to each type. The family models are presented here based on the following criteria: parents' education, labor market activity, financial situation, lifestyle, family structure, parents' relationship with each other, parental attention to the child, problems at school, and the child's vision of the future. To establish the social status of families, we drew on the results of an earlier representative national study (Pusztai & Engler, 2020) and differentiated between four family models during the qualitative analysis (rural low status, rural or small-town strivers, urban middle class, and urban educated high status). Rural or small-town stable educated families were not represented in the interviews.

The group of rural low-status families is represented here by parents who are in the worst situation in terms of residence, education, employment, and income. These parents predominantly have a primary school education and a significant proportion of them are unemployed, in public employment, or in casual undeclared work. In addition, many are employed as unskilled or semi-skilled workers in factories or plants close to their place of residence. Mothers are typically unpaid homemakers or receive childcare benefits. Their disadvantaged position in the labor market places a significant proportion of these parents in the lowest income decile. According to our interviewees, in families which face difficulties making ends meet, students' attitudes to work is often characterized by the desire to make money easily and quickly. School professionals have found that in addition to multigenerational family communities, there is an increasing proportion of children in structurally changed, non-intact families, and foster care or residential care. Under these circumstances, preparation for adult life within the family often means the transmission of deviant behavior (e.g., alcohol and drug abuse or delinquency), as well as physical and verbal violence. In rural low-status families, school experiences and children's academic progress are hardly ever discussed and the amount of time spent on traditional child-rearing activities (e.g., story reading, homework help, and joint leisure activities) is low. Several interviewees highlighted physical neglect, unjustified absenteeism, early school-leaving, conflicts within the community, and behavioral difficulties. In addition to these, school-related crimes also exist, although less frequently, with mentions of stabbings, theft, or drug distribution. Mothers sometimes ask for teachers' help in preventing early school-leaving or in concealing academic failure (e.g., from the father). In the experience of the interviewees, some children living in serious multigenerational poverty aim to start a family in their teens and work in public service (public workers' foreman), prostitution (pimping), or drug trafficking.

Of course, they want to copy the models and patterns that are easily available to them, or these are the ideas that can be detected in their plans. However, I can often see that they don't really mean these things seriously. They seem to be resolute, but I know that the course of their families' lives and their financial status make them realize it's all very well saying that they are going to pimp and traffic drugs, but they see that things work differently, because everybody in their surroundings is struggling to make ends meet, so these aren't really good options. (F8/2)

Occasionally, working abroad seems to be a possible way out (e.g., manual labor in Austria or Germany). This observation also emerged later in relation to family life education, as weak attachment to parents anticipates the break with the tradition of caring for the elderly.

In the narratives of our interviewees, Roma families living in segregated areas formed a separate subgroup. During family visits, interviewees found that families suffer from disadvantages due to a lack of economic, cultural, and linguistic capital; furthermore, anomic conditions could be detected within some communities. Children's family socialization reflects the openness of family life to the outside world, children's autonomy and freedom of movement, and the early entrenchment of traditional gender roles.

The Roma girls who come to our secondary school are clever and smart. [...] They do quite well, but the problem is that when they're between 16 and 18, their families will come up with the idea that they should stay at home to look after a sick relative. Or they become pregnant and the pregnancy will be declared high-risk due to their age, so they will have to stay at home. As a result, they drop out and fail to acquire the qualifications they would otherwise be able to obtain. I have followed the lives of many girls who finally did not manage to learn even a trade, although they could have obtained a high school diploma and found a way out... but they didn't. (F8/4)

The group of rural or small-town strivers is dominated by parents with vocational education, who fall into the low-income group due to the limited socioeconomic opportunities of their places of residence. Socioeconomic status is closely correlated with family structure according to the findings of the 2020 Parent Survey (Pusztai & Engler, 2020), which observed that the proportion of families with intact structures in lower-status families was strongly decreasing and the number of children was increasing. This means that an unfavorable family structure pattern is imprinted on a growing number of children during spontaneous family life education. Single parents are seeking to share their increased child-rearing responsibility with more educational partners (e.g., grandparents or teachers). School professionals very often encounter family crises. A distinctive subgroup of this family type is that of skilled agricultural workers. As strengths of this status group, our interviewees cited cohesive local communities and the transmission of strong family values (e.g., educating children for work or respect and appreciation for work), which also shape children's perceptions of work. Students tend to be oriented towards vocational training, which offers scholarships and benefits. An important consideration in these young people's career choices is that a regular income can provide significant additional income for their families.

The value preferences that today's parents inherited from their families of origin are very important. I mainly mean farmer families, for whom work was a core value. They did agricultural work and the only way to get by was to work 10–12 hours a day to earn their daily bread. This is something that still motivates these families. They strive to transmit these values to their children, convincing them that work indeed is the way to earn a decent living. [...] In those remote, disadvantaged areas, parents do consider education as a value which gives their children the only opportunity to move upwards. They do their best and some even sacrifice everything for that purpose. (F8/2)

Much of the urban middle class is made up of self-employed skilled workers (small business owners, tradesmen, craftsmen, and family business owners) or white-collar workers with a high-school diploma, who are in an advantageous position in terms of income. The staff in schools with a more favorable social composition and in church-run educational institutions encounter families with a more promising social situation, which means that children's achievement, future prospects and relations with parents are better, but it is also characteristic of these schools that children often come from single-parent or patchwork families. Overall, students have much more ambitious plans for the future than in the groups described above.

"It is also typical in our school, though, that many of them live in broken families or patchwork families" (F3/6).

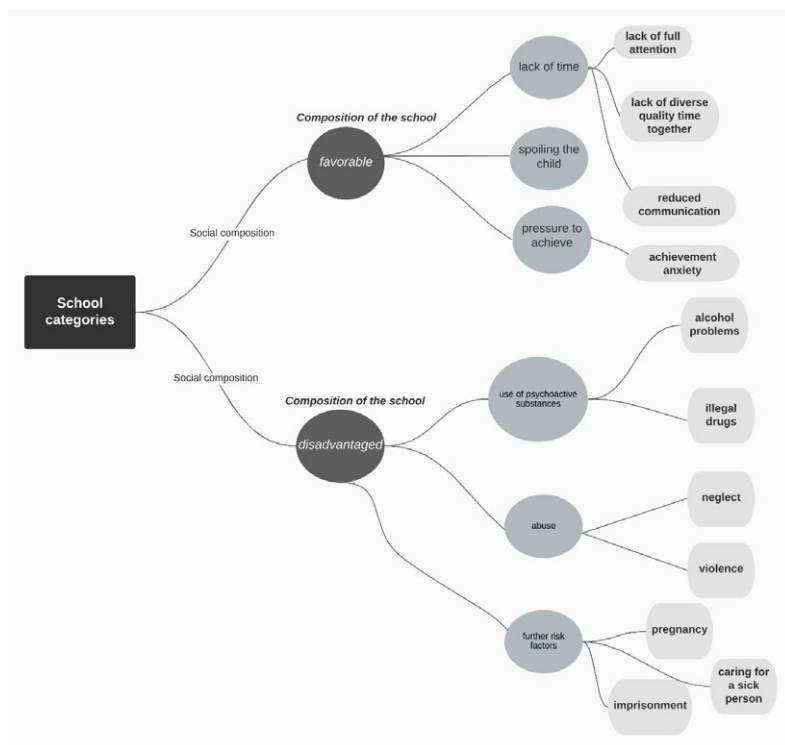
Among urban educated high-status families, parents are usually civil servants, but the number of people employed in the private sector is the highest here. Furthermore, the group is made up of those with the most favorable income, predominantly living in complete families. Teachers and support staff, however, report limited childcare activities and less diverse interactions. The middle classes are now characterized by the loss of quality time and full attention, and a decline in communication and activities promoting intellectual and emotional development. They also suffer from anxiety associated with a strong pressure to achieve. Students are likely to plan to get a higher education, but they sometimes consciously opt for a different career path than that of their parents.

It is very difficult to get into contact with parents, because they usually work long hours and are unavailable. They have often let me know that they are very busy, which leaves its mark on the children as well. No wonder that especially the older ones are prone to reject their parents' lifestyles or career paths because they feel they have been badly affected by them. They even articulate it by complaining that mom is very stressed about her work, and she has so much trouble because of her work. (F8/3)

Figure 1 summarizes the problem types most commonly perceived by teachers and support staff, comparing schools with a favorable and disadvantaged student composition.



Figure 1. Code Sets of the Family Problem Map Which Serves as a Basis for Adult Life Education



Own source.

## Conclusion

Family life education has been part of the National Curriculum in Hungary since 2020, but the curriculum takes account of average, middle-class families, while the composition and problems of families vary widely across regions and social classes. Schools catering for pupils from more advantaged family backgrounds and schools catering for children from low-status families encounter very different family subcultures. Not only do the sociodemographic and cultural backgrounds of families differ, but spontaneous family life education within families also varies widely. In our study, spontaneous family life education is defined as the process whereby students, growing up in their own families, experience patterns of spousal and parental role fulfilment and practices of managing human and material resources within the family.

In today's Hungary, the variety of spontaneous family and adult education experienced by children and young people in families is extremely large, the individual family

subcultures are at an incredible distance from each other, and the distances are much greater than in a stable, bourgeois society. Education for family life in schools must take this into account. An almost universal feature is the impoverishment of communication within the family, the reduction – in some cases the complete disappearance – of the time that family members spend together, and the dysfunction of family structures, as a result of which the family is unable to fulfil its traditionally well-functioning role as an educator of adults. The dysfunction of family and adult education is even more prevalent in single-parent families, the premature maturation of children, the experience of belonging nowhere in the patchwork family, or the negative consequences of parental competition. A special feature of the middle classes is the use of parental time – especially the reduction of full attention and quality time – and the lack of communication, attention, and activities that ensure emotional and intellectual development, which parents compensate for with objects. In the case of middle-class adults, there is also a strong pressure to perform, which causes anxiety. In low-status families, the preparation for family and adult life is often marked by verbal violence, physical abuse, child mistreatment, and the perpetuation of deviant behavioral patterns. We have confirmed the suggestion of researchers (Myers-Walls, 2000; Ballard & Taylor, 2011; Darling et al., 2022) that context is essential: without knowing and interpreting the family life experienced in families and the behavioral patterns of adults, it is not possible to start relevant development and implementation of content and methods; there is no procedure that can be fully standardized.

These patterns have a powerful impact on students' success at school, their future plans and the positions they intend to occupy in society. Our study points to the need for a thorough understanding of spontaneous patterns of family life education prior to the implementation of family life education in schools and for curricula and teaching aids to address the diversity of family subcultures. Teachers must also be aware of the fact that adult or family life education involves different activities for students coming from different subcultures. A limitation of our study is that the picture revealed by teachers and school support staff is obviously subjective, but they are still the most authentic sources of information on the diversity of families. The limitation of our research is that we focused on one deprived region. A nationwide quantitative analysis would be needed to get a full picture of what is happening to families.

## REFERENCES

- Ballard, S.M., & Taylor, A.C. (Eds.). (2011). *Family life education with diverse populations*. Sage Publications.
- Buehler, C. (2020). Family processes and children's and adolescents' well-being. *Journal of Marriage and Family*, 82(1), 145–174. <https://doi.org/10.1111/jomf.12637>
- Dafinou, A., Olaya, B., & Essau, C.A. (2022). Parental economic migration and children's outcomes in Romania. The role of social support, parenting styles, and patterns of migration. *Journal of Family Issues*, 43(3), 567–587.
- Darling, C.A., Cassidy, D., & Ballard, S.M. (2022). *Family life education: Working with families across the lifespan*. Waveland Press.
- Demo, D.H., & Acock, A.C. (1993). Family diversity and the division of domestic labor: How much have things really changed? *Family Relations*, 42(3), 323–331. <https://doi.org/10.2307/585562>
- Duncan, S.F., & Goddard, H.W. (2016). *Family life education: Principles and practices for effective outreach*. Sage Publications.
- Engler, Á., Kozek, L., & Németh, D. (2020). The concept and practice of family life education. *Central European Journal of Educational Research*, 2(3), 55–61.
- European Court of Auditors (2020). *Combating child poverty: Better targeting of Commission support required. Special report 20*. Publication Office of the European Union. <https://www.eca.europa.eu/en/publications?did=54614>
- Makay, Z. (2019). Fiatalokori gyermekvállalás Magyarországon. *Korfa*, 19(1), 1–4. <https://demografia.hu/kiadvanyokonline/index.php/korfa/article/view/2763/2669>
- Mancini, J.A., O'Neal, C.W., & Lucier-Greer, M. (2020). Toward a framework for military family life education: Culture, context, content, and practice. *Family Relations*, 69(3), 644–661.
- Myers-Walls, J.A. (2000). An odd couple with promise: Researchers and practitioners in evaluation settings. *Family Relations*, 49(3), 341–347.
- Myers-Walls, J.A. (2020). Family life education for families facing acute stress: Best practices and recommendations. *Family Relations*, 69(3), 662–676. <https://doi.org/10.1111/fare.12452>
- Oz, S. (1991). Attitudes toward family life education: A survey of Israeli Arab teachers. *Adolescence*, 26(104), 899–912. <https://pubmed.ncbi.nlm.nih.gov/1789177/>
- Plaza-del-Pino, F.J., Soliani, I., Fernández-Sola, C., Molina-García, J.J., Ventura-Miranda, M.I., Pomares-Callejón, M.Á., & Ruiz-Fernández, M.D. (2021). Primary school teachers' perspective of sexual education in Spain. *Healthcare*, 9(3), 287. <https://doi.org/10.3390/healthcare9030287>
- Pusztai, G., & Csók, C. (2023). Views of teachers and support staff at schools on the implementation and development of family life education. *European Journal of Contemporary Education*, 12(4), 1401–1409.
- Pusztai, G., & Engler, Á. (2020). Értékeremtő nevelés az iskolában és a családban. *Kapocs*, 3(2), 5–132.
- Tóth, O. (2018). A nők elleni párkapcsolati erőszak Magyarországon. *Socio.hu Társadalomtudományi Szemle*, 8(4), 1–28. <https://socio.hu/index.php/so/article/view/688>
- Ulferts, H. (2020). *Why parenting matters for children in the 21st century: An evidence-based framework for understanding parenting and its impact on child development*. OECD. <https://doi.org/10.1787/129a1a59-en>
- Varani-Norton, E. (2014). "It's good to teach them, but... they should also know when to apply it": Parents' views and attitudes towards Fiji's family life education curriculum. *Sex Education*, 14(6), 692–706. <https://doi.org/10.1080/14681811.2014.934443>
- Wiley, A.R., & Ebata, A. (2004). Reaching American families: Making diversity real in family life education. *Family Relations*, 53(3), 273–281. <http://www.jstor.org/stable/3700345>

Yildirim, G. (2019). The views of pre-service primary school teachers regarding the concept of "basic life skills" of life science course. *Educational Policy Analysis and Strategic Research*, 14(3), 64–79. <https://doi.org/10.29329/epasr.2019.208.4>

### Copyright and License



This article is published under the terms of the Creative Commons Attribution – NoDerivs (CC BY- ND 4.0) License <http://creativecommons.org/licenses/by-nd/4.0/>

#### Source of funding

The research on which this paper is based was conducted by the MTA-DE-Parent-Teacher Cooperation Research Group with the support provided by the Research Programme for Public Education Development of the Hungarian Academy of Sciences.

#### Disclosure statement

No potential conflict of interest was reported by the author(s).