

Cognitive and Informative Level of Knowledge about Puberty in Primary School Pupils in Sweden

Miluše Rašková, Palacký University Olomouc, Czech Republic
Marcela Otavová, Palacký University Olomouc, Czech Republic

The European Conference on Education 2019
Official Conference Proceedings

Abstract

Knowledge is gained in the process of learning and represents the level of awareness. The level of knowledge about puberty includes the amount and quality of relevant information. Puberty culminates when the reproductive capacity is achieved. Puberty can be described as a major hormonal process involving significant physical changes, mental changes, and awareness of one's own personality. Puberty is an important element of sexual education in both the European and the global dimension. Children need to be prepared for puberty on time and in an appropriate manner, including all changes, relationships, and contexts. Timely preparedness for puberty means that children should acquire the necessary knowledge of puberty before it starts. That is, during the prepubescent period, when they are primary school pupils. The present educational research focused on the level of knowledge about puberty among primary school pupils in Sweden in the context of research results in the Czech Republic, China, and Spain. The research instrument to analyse the level of knowledge about puberty among primary school children was a knowledge achievement test. The level of knowledge about puberty was verified by 9 free-response test tasks. The content of the test tasks focused on the concept of puberty, definition of puberty, age range of puberty period, knowledge of bodily changes in boys and girls, knowledge of other changes emerging in puberty, and importance of puberty in human life. Descriptive statistical methods were used to describe the data sets and their characteristics.

Keywords: puberty, pupils, knowledge, testing, results.

iafor

The International Academic Forum
www.iafor.org

Introduction

Previously, the authors published the results of testing the level of knowledge about puberty among primary school pupils in the Czech Republic, China, and Spain including a comparison of these countries (Rašková, Provázková Stolinská, 2018; Provázková Stolinská, Rašková, 2018). The authors also published their results concerning communication about puberty among Czech and Chinese primary school pupils, their teachers and families (Rašková, Provázková Stolinská, 2015, 2017; Rašková, Provázková Stolinská, Vavrdová 2015). The results of this questionnaire survey revealed children's perspective of communication about puberty with their peers, parents, and teachers. In the area of verbal communication, friends and classmates together with the mother and teachers in school were more frequent sources of information about puberty than visual sources. If children communicated with each other about puberty, they did so sometimes or rarely; children considered puberty a normal and natural phenomenon. Children assessed their information about puberty as adequate and were interested in knowing more.

The present paper describes a topic which is part of a contextual educational research started in 2015. The research is carried out as part of Student grant competition at Palacký University Olomouc (IGA_PdF_2019_020; Cognitive and informative level of knowledge about puberty among primary school pupils in Sweden; principal investigator doc. PaedDr. Miluše Rašková, Ph.D.). The key concepts of the educational research were puberty (Vágnerová, 2000) and knowledge about puberty among primary school children in Sweden in the context of the Czech Republic, China, and Spain.

Puberty is a significant element of sexuality education in an international context (Comprehensive sexuality education, IPPF; Standards for Sexuality Education in Europe, 2010) and represents an important aspect in comprehensive education of children. A number of countries not only in Europe are accredited members of the International Planned Parenthood Federation (IPPF), which defines the context of human rights and is active in the area of sexual and reproductive health. In 2010, the World Health Organization (WHO) drafted the Standards for Sexuality Education in Europe, 2010, the purpose of which is to help introduce a system of comprehensive sexuality education from birth.

Sexuality education including the issue of puberty has three levels (Rašková, 2008, etc.), which are affected by a number of components including the family, school, external environment – world around the child, etc. One of the three levels is the cognitive level, which represents the tier of gaining knowledge (i.e. the cognitive line in the form of basic information, knowledge, skills and habits). These three tiers including emotions and relationships and the level of skills, habits and behaviours overlap, cannot exist in isolation, and none of them can be omitted. Emotional relationships of the child serve as the basis for behavioural patterns; these models then become a pillar for gaining sexual knowledge.

The cognitive and informative level of learning about puberty represents the tier of gaining knowledge and includes the amount and quality of relevant information (i.e. knowledge) that the child should learn or has learned. The authors of the study tested the cognitive level, which is the pillar of general education of each person.

Knowledge (Janík, 2005) is gained in the process of learning and represents the level of children's awareness. Most information is of a general nature (e.g. puberty, physical appearance, human development, reproductive organs, assertive behaviour, etc.) and is an important part of general knowledge.

The selected data collection method was a non-standardized knowledge achievement test (Hendl, 2006; Chráska 2007). The level of knowledge about puberty was tested by means of 9 items with open-ended answers. The content of the test items focused on the definition of puberty (Q1); puberty age range in both genders (Q2 to Q5); knowledge about physical changes in boys and girls (Q6 to Q7); knowledge about other changes that puberty induces in both genders (Q8); significance of puberty in human life (Q9). Pupils' responses in the test were coded by means of the following numbers: 2 = correct answer, 1 = partially correct answer, 0 = incorrect answer. Test items with a missing answer were coded with the number 5. The data were described by means of descriptive statistics (Hendl, 2006). To identify any statistically significant differences in pupils' responses in Sweden and other countries, the non-parametric Kruskal-Wallis test was used.

The research questions were derived from the research problem and were as follows: What is the level of knowledge about puberty among primary school children before its onset? The research question was complemented with the following sub-questions: What is the level of knowledge among primary school children that they use to define puberty? What is the level of knowledge among primary school children concerning the age range of puberty in both genders? What is the level of knowledge among primary school children concerning physical and other changes in both genders? What is the level of knowledge among primary school children concerning the significance of puberty for their lives? Are there any differences in the level of knowledge about puberty between pupils in Sweden in comparison with pupils in the Czech Republic, China, and Spain?

In terms of the structure of the research sample, the largest group were pupils aged 10 to 12 years.

Table 1: Structure of the research sample.

Summary Frequency Table (DATA)				
Marked cells have counts > 10				
(Marginal summaries are not marked)				
COUNTRY	SEX boy	SEX girl	Missing Data	Row Totals
Czech	71	71	4	146
China	69	66	0	135
Spain	12	14	0	26
Sweden	20	22	0	42
Missing	0	0	0	0
All Grps	172	173	4	349

Conclusions

The results inform about the level of knowledge about puberty among the respondents. Overall, the differences in the point score (questions Q1-Q9) between

countries are statistically significant ($p < 0.0001$). There is also a statistically significant difference in the total point score between all countries.

Table 2: Kruskal-Wallis test – comparison of the overall test results

Depend.: Score	Multiple Comparisons p values (2-tailed); Score (DATA) Independent (grouping) variable: COUNTRY Kruskal-Wallis test: H (3, N= 349) =74,64667 p =,0000			
	Czech R:173,40	China R:136,40	Spain R:307,77	Sweden R:222,43
Czech		0,012794	0,000000	0,033091
China	0,012794		0,000000	0,000008
Spain	0,000000	0,000000		0,004199
Sweden	0,033091	0,000008	0,004199	

The following text describes the overall results concerning the level of knowledge about puberty in individual countries with a focus on the definition of puberty (Q1); puberty age range in both genders (Q2 to Q5); knowledge about physical changes in boys and girls (Q6 to Q7); knowledge about other changes that puberty induces in both genders (Q8); significance of puberty in human life (Q9).

Definition of puberty

Q1 – Definition of puberty: Puberty is a stage in which the reproductive capacity culminates. According to Czech professionals, the period of puberty is marked by the age of 13 to 15 years. Puberty is thus identified as a principal hormonal process of physical changes. A child changes to an adult person who is from a biological perspective ready for reproduction. Biological and psychological changes are also accompanied by social changes.

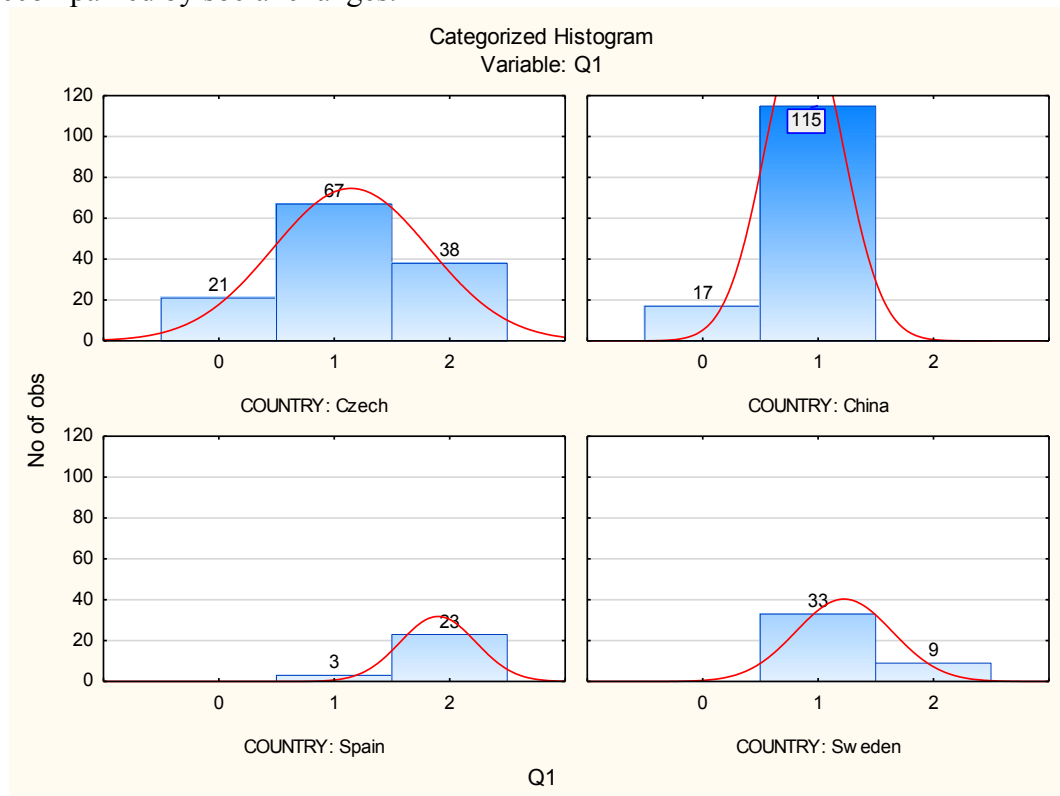


Figure 1: Comparison of pupils' point scores in question 1 by country

Results (Q1): The most frequent answers of Spanish respondents (correct answers) confirm that they have the best knowledge concerning the identification of puberty. The most frequent answers of respondents from other countries suggested partial knowledge. Partial knowledge of Czech respondents suggest that they do not understand puberty in a comprehensive way. They do not associate the achievement of reproduction ability, full sexual maturity and completion of physical growth with psychological and social changes.

Onset of end of puberty in boys and girls:

Q2, Q3 – Onset of puberty in boys and girls; Q4, Q5 – End of puberty in boys and girls: According to Czech professionals, the period of puberty is most frequently marked by the age of 13 to 15 years. This period comes after pre-puberty, which is defined as a transition from childhood to adulthood. Professionals believe that in terms of gender differences, pre-puberty in girls takes place between 11 and 13 years of age, while in boys, physical development is delayed by 1 or 2 years.

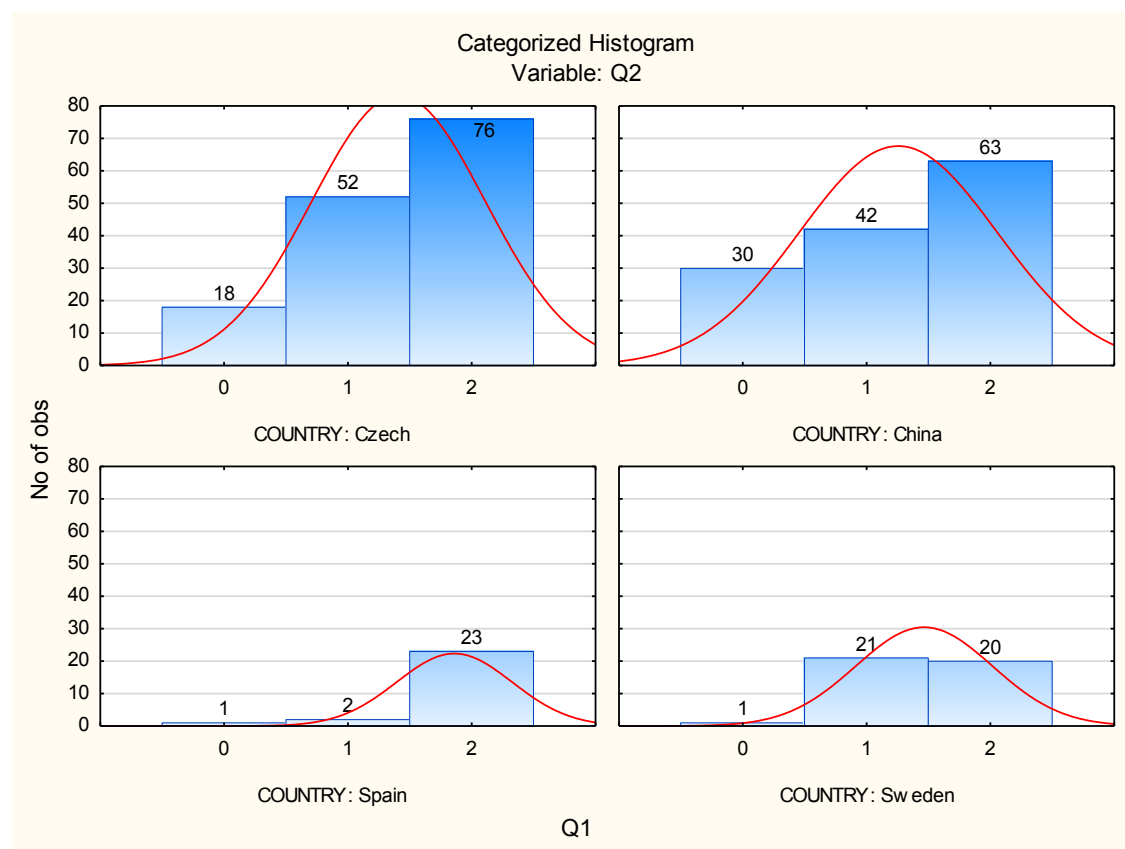


Figure 2: Comparison of pupils' point scores in question 2 by country

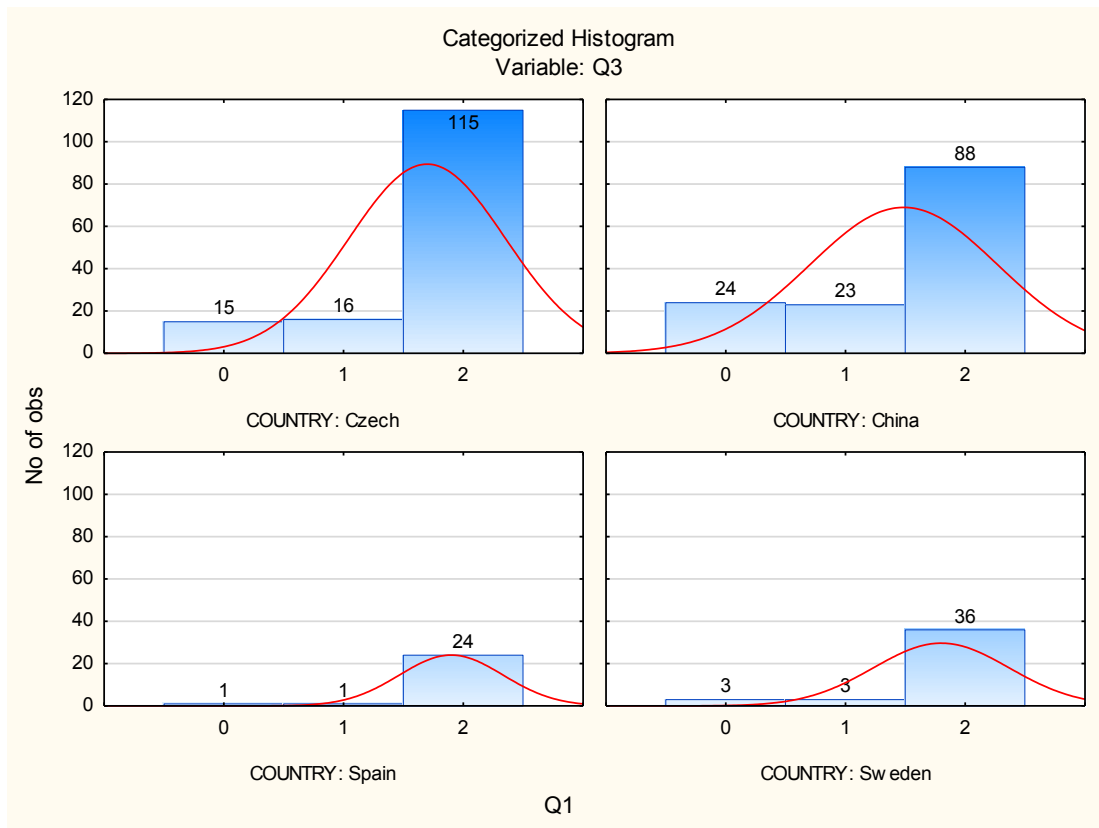


Figure 3: Comparison of pupils' point scores in question 3 by country

Results (Q2 – Q3): Most responses were in the category of correct answer, which suggests that the respondents are knowledgeable about the onset of puberty in boys and girls. The proportion of partially correct answers (or incorrect answers) indicated by respondents from Sweden, Czech Republic and China suggests that pupils' knowledge about the onset of puberty in both genders needs to be enhanced.

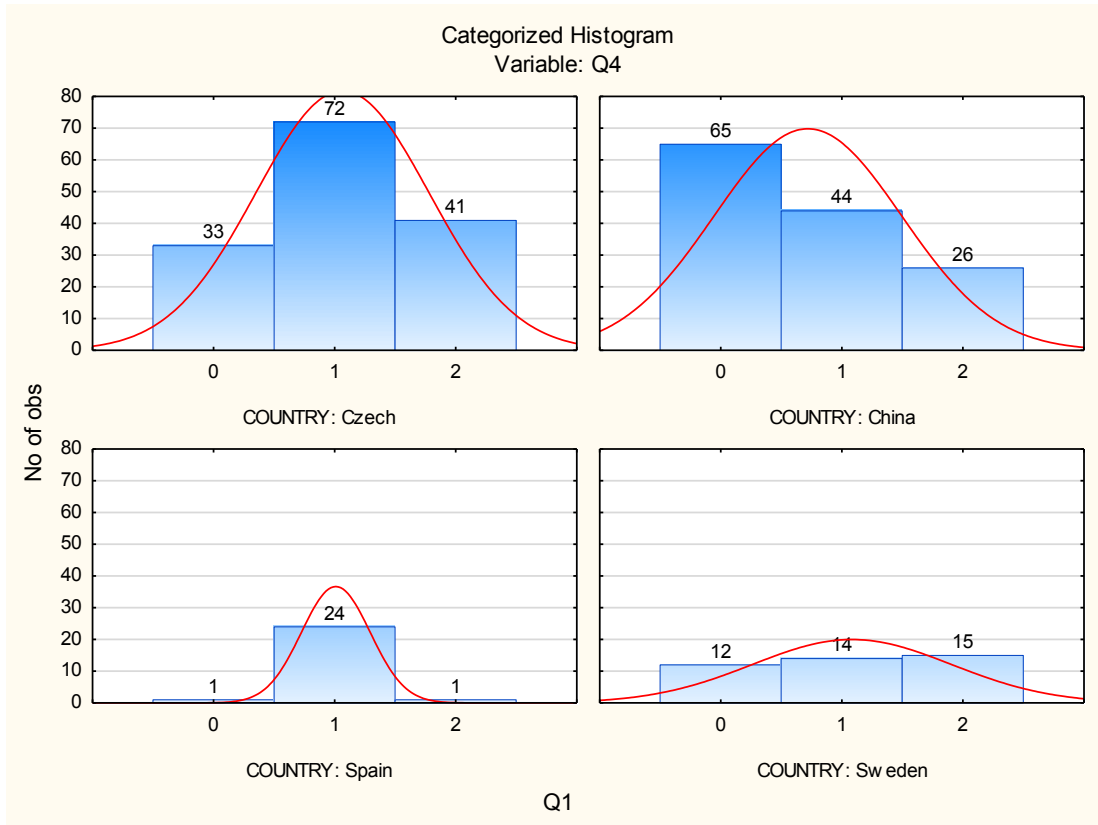


Figure 4: Comparison of pupils' point scores in question 4 by country

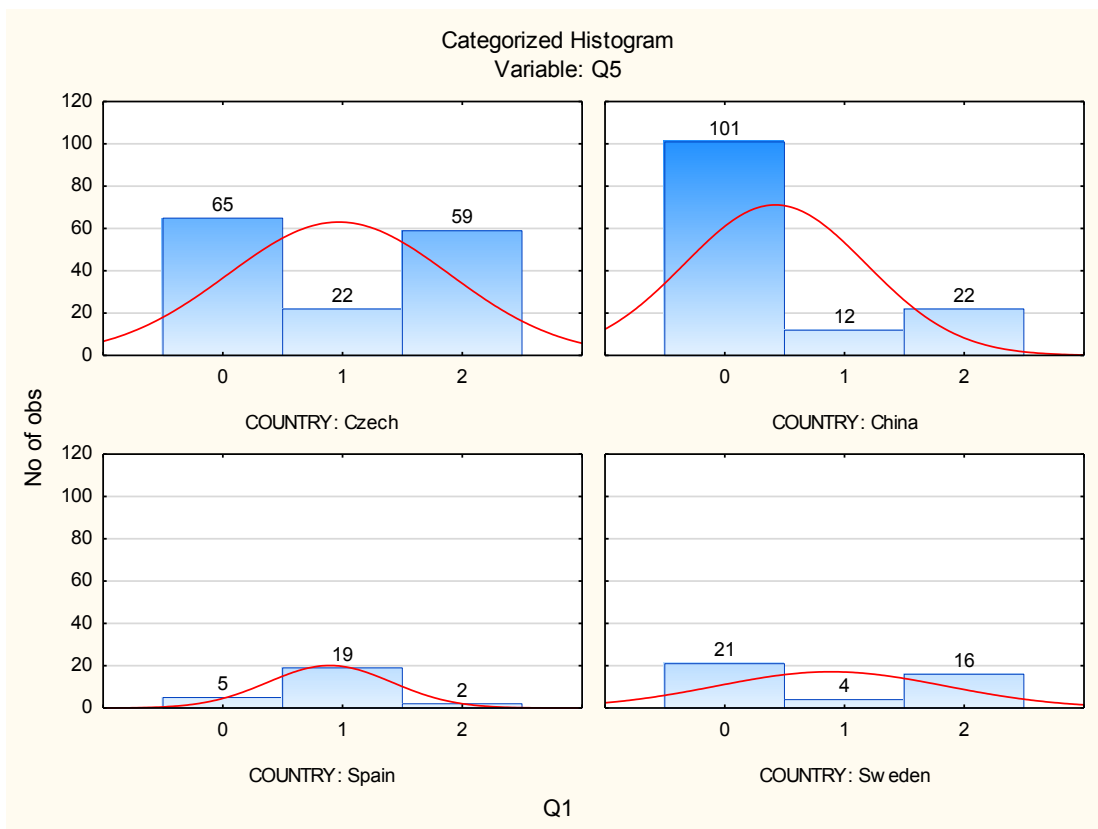


Figure 5: Comparison of pupils' point scores in question 5 by country

Results (Q4 – Q5): Unlike the area concerning the onset of puberty in both genders, where the responses confirmed pupils’ full or partial knowledge in this area (see text above), their awareness about the end of puberty in both genders is worse. This area is dominated by partially correct or incorrect responses, which confirms insufficient knowledge about the end of puberty in both genders.

Physical changes in puberty in girls

Q6, Q7 – Physical changes in puberty in girls: During puberty, the signals concerning the required hormonal changes are sent from the brain to the reproductive organs, which stimulate growth, development of functions and other changes in the brain and other organs. In line with the hormonal process of physical changes in both genders, during which the reproductive organs mature and start to produce sex hormones (sperms or ova), changes in the physical structure take place. During puberty, growth slows down and eventually stops in both genders. There are also changes in the physical structure, secondary sex characteristics appear in both genders including pubic hair in the armpit, skin changes and the development of acne. Changes in boys further include thickening of the body and muscle growth, pubic hair on the scrotum, hair on the face and voice change. Changes in girls include hair in the pubic area, gaining a female shape of the body, and growth of breasts.

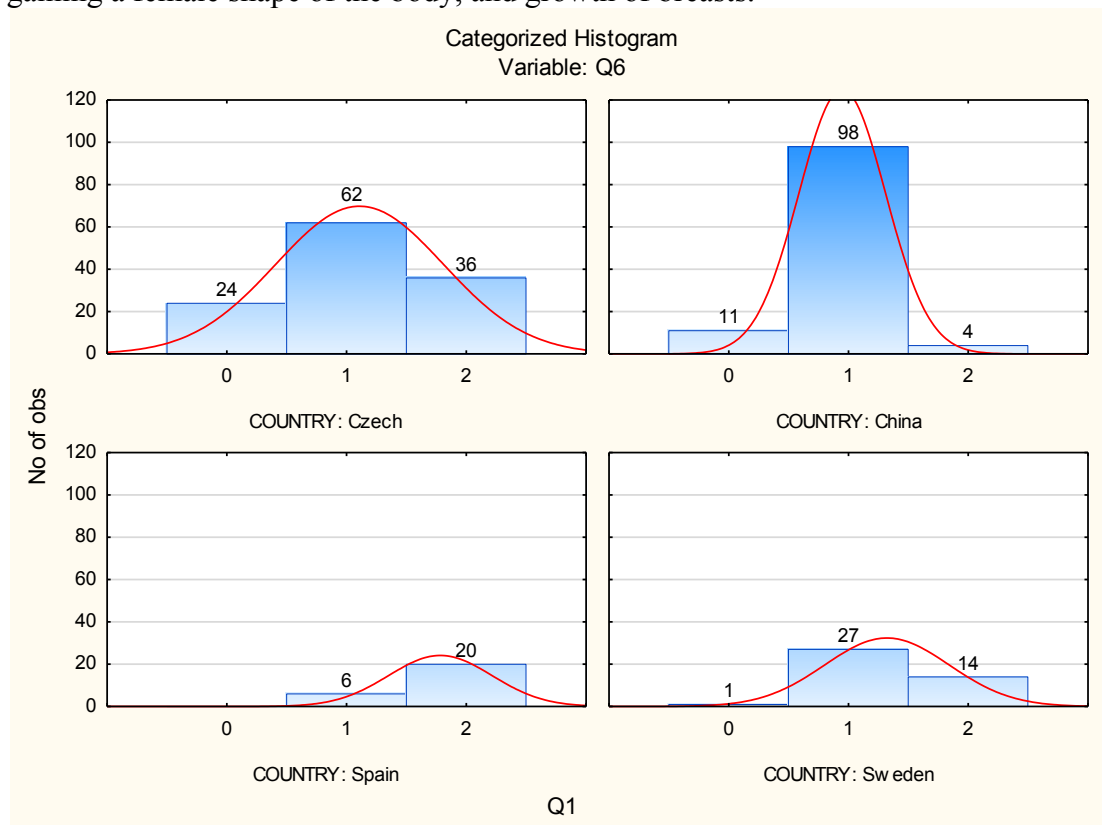


Figure 6: Comparison of pupils’ point scores in question 6 by country

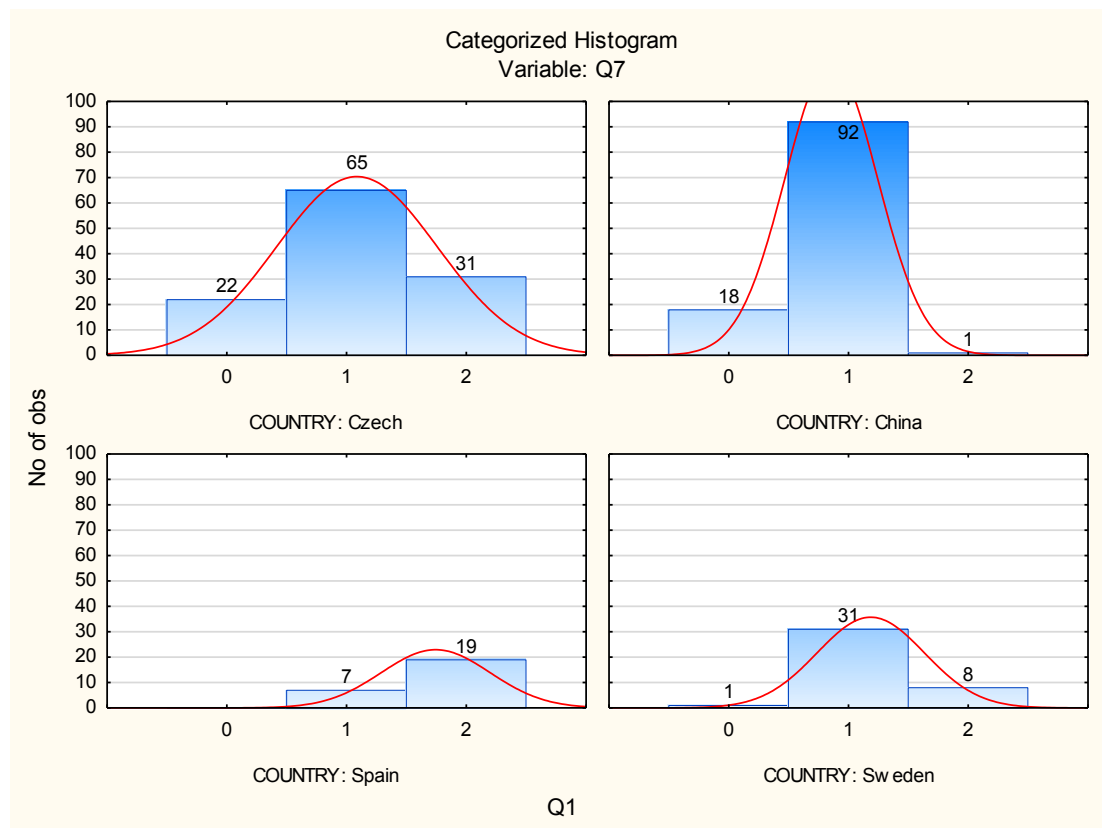


Figure 7: Comparison of pupils' point scores in question 7 by country

Results (Q6, Q7): Most answers of Swedish, Czech and Chinese respondents were in the category of partially correct answers, which suggests basic awareness in the area of physical changes during the period of puberty in both genders. These respondents suggested only various incomplete combinations of changes, which means that they do not have appropriate knowledge from a comprehensive perspective. The most frequent answers of Spanish respondents confirmed their knowledge about the issue.

Other changes in puberty

Q8 – Other changes in puberty: The period of puberty is marked not only by physical changes but also significant psychological changes including becoming aware of one's personality. The social role of an individual changes and manifests as attacks against authority. Further changes affect the attitude to school and the teacher, self-evaluation and way of thinking. Pubescent individuals want to participate in decision making about matters that relate to them, they start to assess adults in a critical way. They want to spend time doing various activities with their peers. Their emotional relationships start to evolve including love and affection. According to psychologists, emotional instability is primarily a consequence of hormonal changes. Secondly, instability may be supported by psychological changes and changes in interpersonal relationships.

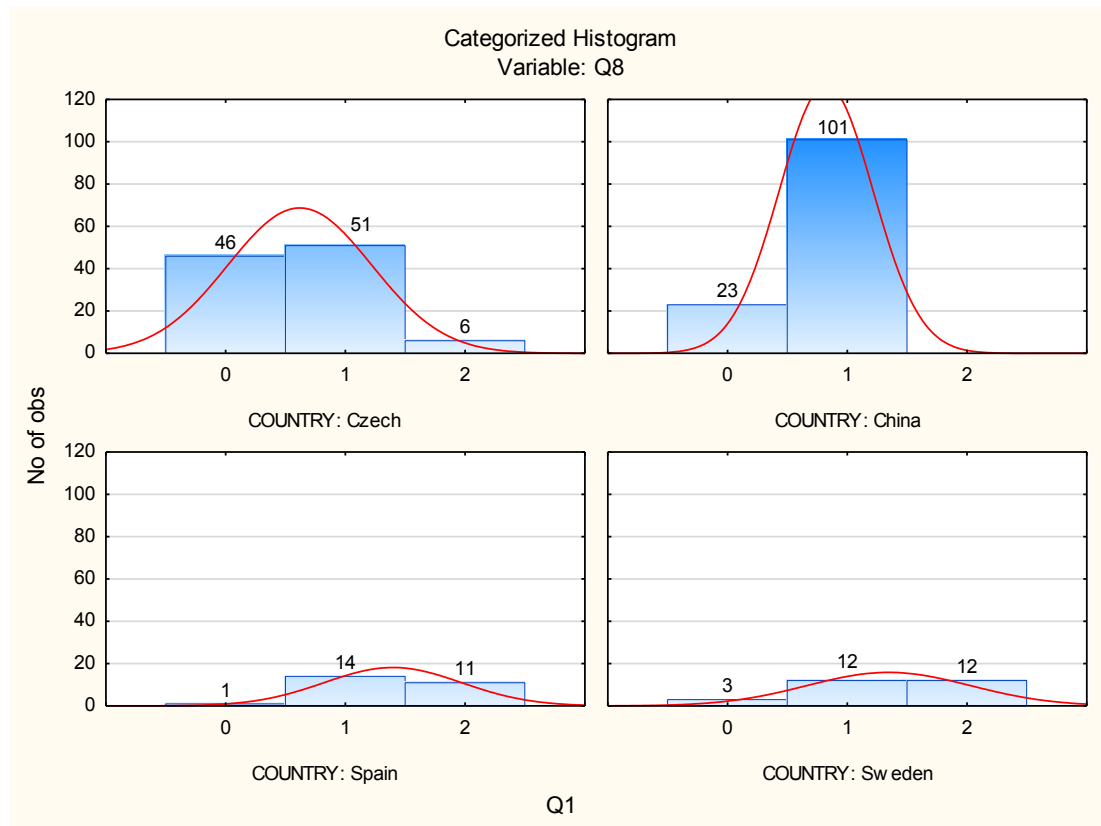


Figure 8: Comparison of pupils' point scores in question 8 by country

Results (Q8): The answers also suggest the respondents' awareness of other changes than biological. Most responses were in the category of partially correct answer. The respondents indicated only various incomplete combinations of other changes. The most frequent responses included the need to spend leisure time with peers, aspects associated with emotional instability, love and affection, and the need to participate in decision making on matters that relate to them. In this question, the least knowledge was shown by the respondents from the Czech Republic.

Significance of puberty in life

Q9 – Significance of puberty: The whole period of maturing is a broadly defined stage of life. On the one hand, this stage of life is marked by the so-called first signs of sexual maturing including physical growth, on the other hand by achieving the reproduction ability, full sexual maturity and completion of physical growth. However, the process of maturing must not be assessed only from a biological perspective but also from the perspective of psychological changes that take place along biological changes. Biological and psychological changes are also accompanied by social changes, i.e. gaining a new social status.

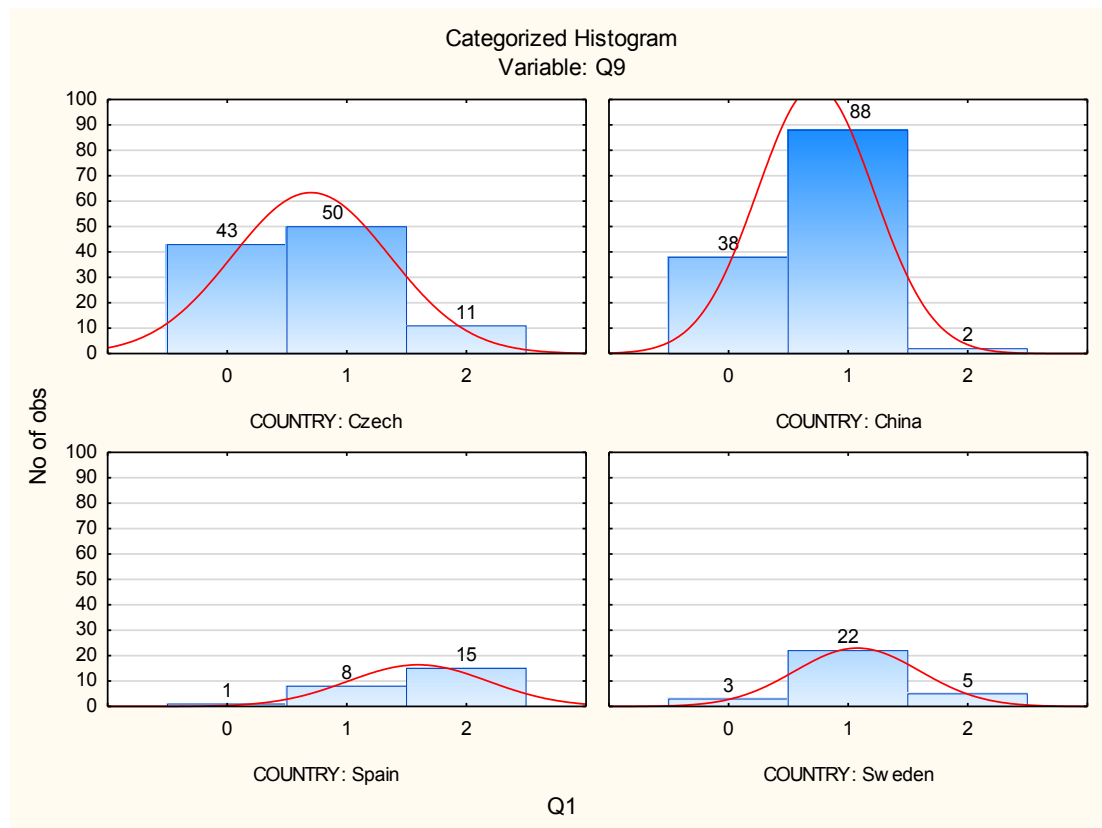


Figure 9: Comparison of pupils' point scores in question 9 by country

Results (Q9): The respondents understand the significance of puberty, which is confirmed by most responses in the category of correct answer among the respondents from Spain. Partially correct answers of Swedish, Czech and Chinese respondents suggest their incomplete knowledge. This suggests that the respondents do not think about the significance of puberty in a comprehensive perspective but rather in various combinations of the biological, psychological and social areas.

Summary of test results concerning knowledge about puberty

Summary of results (Q1 – Q9): From an educational perspective, the knowledge in the area of puberty facilitates coherent personality development. Any incomplete or missing knowledge about puberty suggests that schoolchildren do not consider the issue of puberty and relevant associations and contexts in a comprehensive way. Younger school-aged children are often unaware of the biological aspect and its importance for future reproductive life of each person in context with other changes. Children usually associate puberty only with psychosocial changes. These findings suggest that teachers should strengthen children's knowledge about puberty in terms of a comprehensive approach to all changes in the biological, psychological and social areas, taking into account the specificity of both genders.

Children should learn the required knowledge about puberty before its onset – during pre-puberty when they are in primary school. All children need to be prepared for puberty in time and in an appropriate manner; this should include all associations and contexts related to this stage. Although comprehensive sexuality education including the issue of puberty should be centred around the family, there is no guarantee that children will gain (provided that sexuality education does not become taboo)

subjectively and socially appropriate information, attitudes and behaviour in the broadest sense of sexual behaviour. Teachers and other educators should be professionally and didactically prepared for education about puberty. Communication about puberty in the school environment is the professional responsibility of the teacher (Štěrbová, Rašková, 2014). The role of the school is, through the teacher, to provide the knowledge about puberty, but also to lay the foundations of attitudes and guidelines for decision making, including prevention of risk sexual behaviour. Curricular or extracurricular education of this issue must be delivered in schools in a qualified way, taking into account various educational and psychological particularities of pupils and respecting humane approaches and ethical principles.

Sweden was the first country to include sexuality education in the curriculum. Currently, sexuality education is comprehensive in character and spread throughout the entire educational programme in schools. Both Czech and Chinese educational systems have the issue of puberty embedded in their curricula. In the Czech system of primary education, puberty is defined as part of sexuality education in the national curricular document in the area of Health education. Recently, Chinese education has been subject to a considerable change as a result of the introduction of a new subject – sexuality education. Sexuality education, including the issue of puberty, has become a compulsory subject in some Chinese schools, primarily in Beijing and Shanghai; compulsory courses on this topic have even been introduced in some Chinese universities. Sexuality education in Spain is not included in the national curriculum, but in many schools has become integral part of the school curriculum. The implementation of sexuality education into the school curriculum is purely within the competence of schools. The good results concerning the knowledge about puberty among Czech and Spanish respondents (see text above) confirm the significance of consistent implementation of sexuality education in schools, irrespective of whether the topic is included in national curricula.

Acknowledgements

The authors would like to thank their colleagues Ellen Matlock Ziemann (University of Uppsala) and Isabel Morales Jareño (University of Madrid) who cooperated with the Swedish and Spanish partners. The authors would like to thank their Chinese colleague Wan Zhang Wei for excellent cooperation in the implementation of the research in China. Last but not least, the authors would like to thank Miroslav Chráska Jr. for statistical processing of the results. Our thanks also go to all students who participated in the research.

References

Hendl, J. (2006). *Přehled statistických metod zpracování dat. Analýza a metaanalýza dat*. Praha: Portál.

Chrásková, M. (2007). *Metody pedagogického výzkumu. Základy kvantitativního výzkumu*. Praha: Grada Publishing.

International Planned Parenthood Federation. b. (n.d.) Comprehensive sexuality education. Retrieved from: <http://www.ippf.org/our-work/what-we-do/adolescents/education>

Janík, T. (2005). *Znalost jako klíčová kategorie učitelského vzdělávání*. Brno: Paido.

Provázková Stolinská D., & Rašková M. (2018). Cognitive and Informative Level of Knowledge about Puberty among Primary School Pupils in the Czech Republic and in China. In *Educating for change – The European conference on education, 2018*. Brighton.

Rašková, M. (2008). *Přípravenost učitele k sexuální výchově v kontextu pedagogické teorie a praxe v české primární škole*. Olomouc: VUP.

Rašková M., & Provázková Stolinská D. (2015). *Cognitive and informative level of knowledge about puberty of Czech elementary school students*. Bulgaria: SGEM.

Rašková M., & Provázková Stolinská D. (2015). *Puberty as the concept of pedagogical theory and practice*. Vienna: IAC-TLEI.

Rašková M. and Provázková Stolinská D. (2017). Communication about puberty between children of middle school age and parents. In *8th World Conference on Learning, Teaching and Educational Leadership*. Portugal: WCLTA.

Rašková M., & Provázková Stolinská D. (2017). Teacher-Student Communication about Puberty in Elementary School. In *Ireland International Conference on Education*. Dublin: IICE.

Rašková M., & Provázková Stolinská D. (2018). Knowledge about Puberty among Primary School Children in the Czech Republic. In *11th annual International Conference of Education, Research and Innovation*, Seville.

Rašková M., & Provázková Stolinská D. (2018). Cognitive and informative level of knowledge about puberty among primary school pupils in the Czech Republic, China and Spain. In *The International conference on Education and Educational Psychology*. Athens.

Rašková M., Provázková Stolinská D., & Vavrdová A. (2015). *Educational premises of puberty at primary school*. Olomouc: ICLEL.

MŠMT. *Rámcový vzdělávací program pro základní vzdělávání*. [on-line] Retrieved from <http://www.msmt.cz/vzdelavani/zakladni-vzdelavani/upraveny-ramcovy-vzdelavaci-program-pro-zakladni-vzdelavani>

Štěrbová D., & Rašková M. (2014). *The Specifics of Communication in Relation to Sexuality I: Helping Professions in Relation to Sexuality, Including Persons with Intellectual Disabilities*. Olomouc: Palacký University.

Váagnerová M. (2000). *Vývojová psychologie. Dětství, dospělost, stáří*. Praha: Portál.
WHO Regional Office for Europe and BZgA. (2010). Standards for Sexuality Education in Europe. Retrieved from <http://www.bzga-whocc.de/?uid=20c71afcb419f260c6afd10b684768f5&id=home>

Contact email: miluse.raskova@upol.cz, marcela.otavova@upol.cz