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ORIGINAL PAPER

The Differential Impact of Religion on Self-Reported Health Among Serbian Roma Women

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Abstract

The present paper offers an account of how self-reported health varies with religious affiliation and reproductive effort among Serbian Roma women. Data were collected in 2014–2018 in two Roma semi-urban settlements in central Serbia. The sample consisted of 177 Christian and 127 Muslim women, averaging 54 years of age. In addition to religious affiliation (Christianity/Islam), demographic data, reproductive histories, data on self-reported and children's health were collected, along with height and weight, and smoking status. Christian and Muslim Roma women differed significantly on a number of variables, with Muslim women reporting poorer health and higher reproductive effort. Among Roma women religion may be an important determinant of reproductive and fertility patterns, largely because it may have formed an important foundation upon which identity is based. This study adds to the literature on the cross-cultural relevance of the ways religion shapes reproductive behaviors for understanding the health variations of women from the same ethnic group who profess different religions.

Keywords Religious affiliation · Self-reported health · Roma

Introduction

Based on fieldwork in Serbia, this study examined how self-reported health of Serbian Roma women varies with religious affiliation, Christian versus Muslim, and reproductive effort. In order to have left descendants, all organisms must have solved the challenges of survival, growth, development, and reproduction. These adaptive challenges are termed somatic effort (survival or maintenance, and growth and development) and reproductive effort (Daly and Wilson 1982). Reproductive effort is divided into mating effort (courtship, locating a mate) and parenting effort (gestation, childbirth itself and postnatal child care). Given that reproduction and

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childrearing are not only central to the lives of many Roma women, but may also produce an inverse relationship between reproductive effort and health (Čvorović and Coe 2017), this study focuses on the impact of several aspects of reproductive effort on Roma women's self-reported health that vary along the religious line: reproductive scheduling, intensity of reproduction, and investment after birth.

Theory and data suggest that religions may shape the way individuals interpret health and sickness (Padela and Curlin 2013; Levin et al. 2005; Levin 1994; Jarvis and Northcott 1987; Krause and Hayward 2014; Koenig et al. 2001). In order to persist over time, religion must be transmitted as a cultural trait across generations. More than other cultural traits, religion is transmitted within families, and this ability of traditional religious behaviors to be repeatedly transmitted from ancestors to descendants enables them to influence the descendant leaving success of individuals over many generations (Steadman and Palmer 2008; Bar-El et al. 2013; Bisin and Verdier 2000; Bisin et al. 2004; Bulbulia 2004). Thus, religious affiliation could well be a determinant of economic and demographic outcomes because it has an impact on the perceived costs and benefits of various decisions people make over their lives, including that of reproduction (Blume 2009; Fieder and Huber 2016).

Numerous studies from the field of religion and reproductive health have suggested that an individual's religious affiliation may influence marriage and reproductive patterns (review in Gaydos et al. 2010), but so far, limited research has examined the ways religion shapes the behaviors of women from a minority community (Takyi 2003; Patra et al. 2016; Holtmann and Tramonte 2014; Hjelm et al. 2003; but see Ghuman 2003). Thus, the impact of religion on health differences remains unclear (Green and Elliott 2010). For instance, while mortality differentials exist by religious affiliation (Catholic, Jewish, and Protestant groups) (Sullivan 2010; Kim et al. 2015), health studies have rarely examined the influence of religion on the health of people from the same ethnic group who profess different religions (Karlsen and Nazroo 2010).

Regarding the Roma, much of the existing health research emphasizes shared cultural norms within particular communities and ethnic differences in regard to majority populations (Čvorović 2019; Roman et al. 2013; Janević et al. 2011; Beljić-Živković et al. 2010; Zeljko et al. 2008). And, even though culture can be operationalized as an important research variable (Kleinman 1987; Kagawa Singer et al. 2016; Napier et al. 2014), religious and cultural heterogeneity has not been fully appreciated in Roma research despite the Roma population being heterogeneous in terms of religion, culture, history, socioeconomic status and levels of integration (Marushiakova and Popov 2002; Čvorović 2014). At the same time, Roma women are often overlooked as reflected by the continuous paucity of quantitative and qualitative data, studies and statistics, making them Europe's most invisible minority (Macris 2015).

To address these gaps, this study focused on Roma women, for whom religious identity may have important health outcomes. Throughout the Balkans, and especially in Serbia, the main division among various ethnic groups has always been one of religious affiliations, e.g., Islam versus Christianity. In Serbia, this confessional identification implies the recognition and acceptance of a specific religion, regardless of personal (non) religiousness; for instance, Islam is "a religion of fate," not a religion of choice

(Čvorović and Nikolic 2012). In regard to Roma women in particular, previous studies have found considerable demographic and behavioral differences between Muslim and Christian Roma living in Serbia, with Muslim Roma having more intense reproduction and higher fertility than their Christian counterparts, despite living in similar conditions (Čvorović 2011). Differential fertility is linked to the differences in religious affiliation (Blume 2009; Heaton 2011; Čvorović 2012). Globally, Muslims have been reported to have the highest fertility rate, an average of 3.1 children per woman—well above replacement level (2.1)—than other religious groups (Hackett et al. 2015; Jones 2006), owing to the more traditional cultural environment, young age, less frequent use of contraceptives and homogamous (assortative) mating (Bereczkei and Csanaky 1996; Mascie-Taylor 1986; Thiessen and Gregg 1980).

Serbian Roma are internally divided into groups, distinguished by past occupations, religion and language; ethnicity being maintained by rules based on tradition and endogamy—social stratification and limited marriage choice have preserved local kinship identity in most places. According to a Serbian census, the majority of 140.000 Serbian Roma declared as Christian Orthodox (61.2%) and one-fourth (25%) as Muslims (Radovanović and Knežević 2014). In general, Roma religiosity is low, characterized by ignorance of the official teachings and strong superstitions (Čvorović 2006). As the old Roma/Gypsy saying goes: "Worldwide, there are 77 and a half religions, and we are that half" (Đordjević 1932). The religion which a Roma tribe or ethnicity might hold on to depends on location and circumstances: for Serbian Roma religion represents a cultural tradition, a form of cultural expression and cultural identity marker, which serves to define boundaries among various Roma subgroups (Čvorović 2004; Boyer 2001; Woodhead 2011).

Previous studies on self-reported health among Roma women found that greater height, active coping and less everyday stress from children were associated with better self-rated health (Čvorović and James 2018; Čvorović 2018a, b), despite relative poverty and sporadic use of prenatal care and other health services (Coe and Čvorović 2017).

Reproduction is associated with energetic and metabolic costs, and growing evidence points to relationships between patterns of childbearing and health outcomes for mothers (Kirkwood and Rose 1991; Spence 2008). Since direct costs of reproduction may result in higher energetic demands and thus more negative health consequences (Jasienska 2017; Ziomkiewicz et al. 2016; Gagnon 2015), it is expected that women's health will be negatively affected by the reproductive effort, and more so among Muslim Roma women. This study is the first to examine the potential health differentials between Muslim and Christian Roma women living in Serbia in regard to reproductive effort.

Method and Measures

Overview

Fieldwork, involving the collection of qualitative and quantitative data, was conducted in 2014–2018 in two distinct Roma communities on the outskirts of a

mid-size country town in central Serbia, as a part of an ongoing larger anthropological study on health and culture among Roma women (Čvorović and Coe 2017, 2018). Both settlements were semi-urban, characterized by relative poverty and segregation. Roma in both settlements have preserved for the most part their traditional social organization. Thus, extended family remained the most important social unit while a high level of endogamy was maintained toward non-Roma and Roma from other groups. Interaction between the two settlements was limited, and religious affiliation was an important means of distinguishing between them. For the two studied groups, the kinship-organized residence has helped to preserve a sense of local, distinctive identity: the groups were perceived as being entirely different. Both groups have origin stories told by old people about the alleged ancestor (Čvorović 2010). According to Muslim Roma, their ancestors were a part of the Turkish army that ruled the world: many fought bravely on the Turkish side for centuries. When the Turks decided to leave Serbia, they wanted to take the Roma soldiers and generals with them. Some left, but one family decided to stay and start a new life as blacksmiths. In the past, as the story goes, their group was known for being the best blacksmiths in the area. This group acknowledges their Roma/Gypsy roots, but insists they "have nothing to do with ordinary Gypsies (*Cigani*)".

Christian Roma have their "own" origin story, by which they distinguish themselves from other groups in the area. According to the story, their ancestors were "world travelers", famous musicians, playing one instrument or another, who made their living by entertaining local people. They travelled around the world until 1 day they found a river and decided to settle down: that was how their present settlement was founded more than hundred years ago.

In addition to having different origin stories and alleged ancestors, Muslim Roma had typical Turkish names, declared as "true" Roma, and spoke a distinctive form of Romani. Their culture appeared as a mix of Islamic and Orthodox elements: for instance, they celebrated Islamic holidays but, at the same time, many also celebrated Orthodox Christmas and *slava* (patron saint's day), a typical Serbian family holiday. Some said they had to adopt Christian customs in order to survive during the political turmoil and wars in the 1990s. They were loathed by Christian Roma, who called themselves Serbian Gypsies (*Srpski Cigani*) and claimed that (Muslim) Roma "have no culture". In contrast to Muslim Roma, Christian Roma considered themselves to be "just like the Serbs", had Serbian names, while few spoke their own version of Romani, i.e., "half Romani and half Serbian".

Both Muslim and Christian Roma celebrated traditional Roma holidays which has gained in popularity in recent years, being sponsored by the local government and cash payments made to each Roma family on the festive days to acknowledge the Roma minority.

In spite of the perceived internal differences, the settlements shared typical Roma-distinctive demographic features, including a young age-pyramid, higher birth rates than the majority, massive unemployment, poor education, and substandard housing. Roma girls were married young after brief period of basic schooling and were expected to bear children and play a central social role in their communities as caregivers within their families. Most women did not work outside their homes and were financially dependent on welfare and the male members of their families.

The sample consisted of 177 Christian and 127 Muslim women (total 304), averaging 54 years of age, with a range of 40–80. All participants had personal ID and health cards. The Roma women were recruited from the general population of the settlements during door-to-door research, and informed consent was obtained from all participants. Approval to conduct a study of human subjects was awarded by the Institute of Ethnography SASA research committee (253/1.2).

When estimating reproductive effort, the usual practice of limiting the sample to postmenopausal women may lead to bias; in most cases, fertility ceases well before actual menopause, therefore, limiting the sample to postmenopausal women could lead to an unnecessary reduction in sample size (Strassmann and Gillespie 2003). In addition, the main characteristic of the female population who declared themselves to be Roma in Serbia is rapid reproduction at the beginning of their fertile years (15–24 years) while notably less engage in reproduction after 25 years of age (UNICEF 2014; Čvorović and Coe 2018). Thus, women over 40 years of age, who had been married at least once, and had given birth to at least one child were included in the study. They were interviewed face-to-face in their homes or that of a neighbor in Serbian language.

A questionnaire was formulated to gather data about Roma women's demographics (age, religious affiliation, school levels, socioeconomic status/SES), smoking, marital and reproductive histories (reproductive scheduling: age at first and last reproduction, duration of lifetime reproductive period/years between giving birth to the first and to the last child; birth spacing in years; failed reproductive attempts (miscarriages); and investment after birth: number of surviving children, duration of lifetime breastfeeding in months, and health status of one's children). Cross-sectional measures were employed, while stature and weight were collected using standard procedure (Gallagher et al. 2009).

Questions on children's health were included as many studies have found a positive association between parent's and children's health: parents of children with chronic health conditions show higher levels of stress which generally correlate with poor health, including cardiovascular, gastrointestinal, immune, and neurological health problems (Miodrag and Hodapp 2011; Chaturvedi et al. 2014). Since Roma mothers are the primary caretakers of children, often raised in poor environments, these may be important determinants of Roma women self-reported health.

Direct measures of health such as weight and height are often used to examine the trade-off between growth and reproduction by using weight as a measure of growth (Hill and Hurtado 1996), while height is frequently used as a measure of long-term health and prevalence of infectious disease during childhood (Sear 2007), and may represent a measure of the phenotypic quality of a woman (Sear et al. 2004).

Health status was self-reported, as a summary measure of overall health. SRH is a common measure in field surveys and independently predicts health outcomes, including all-cause mortality, morbidity and health service utilization (Schmitz et al. 2013). A comparative measure of SRH was used ("How would you assess your health status in comparison with other women of your age that you know?") (Jylhä 2009), given that Roma women tend to define good health in terms of their ability to perform their duties as mothers, wives and family caretakers in everyday life (Coe and Čvorović 2017). Self-reported diagnosed chronic conditions were also

collected (diabetes and hypertension), but this variable may not be a good health indicator among Roma women regardless of the symptoms or actual condition since, for many women, being sound and tough were a matter of pride and personal and social achievement.

A set of questions regarding the health and kinship hierarchical relationship within one's family (levels of gender autonomy, including status of women within a family, gender-related power differences in decision making, and relationship with children) were addressed through a semi-structured questionnaire, with both fixed and open-ended questions. Additionally, women were asked about their participation in religious celebrations of the major Christian and Muslim holidays, individually or as part of a congregation within their communities. The involvement was measured in four categories: never, frequently, regularly, and occasionally. As religious participation may have an impact on health outcomes through its provision of social ties and social support, Roma women were also asked to rate social support from their respective communities (Idler et al. 2017). The qualitative data regarding kin, family relations and health form the basis for a separate paper (Čvorović and Coe 2018) and will be only briefly discussed here. Regarding health and well-being, participants were asked about personal experiences of disease and health and the main causes of their own health problems.

Descriptive statistics, Chi-square and *T* tests, and Cohen's D were used to detect differences in demographic, health and reproductive variables between the Roma women based on their religious affiliation (Christianity vs. Islam). In addition, three separate hierarchical binary logistic regressions were conducted to evaluate which independent variables predicted SRH: for the entire sample, and since Christian and Muslim Roma females differ in a number of variables, separate regression analyses were performed for each group, with SRH as the outcome.

All health variables were coded as dummy: 1—poor health and 0—good health. To avoid problems with expected frequencies less than 5 in the statistical analyses, the categories for the children's health variable were collapsed into two: having a sick child or not having a sick child. SES had three modalities: poor SES, average SES, and above average SES. Religious involvement was coded from 0 to 3 (0—never, 1—regularly, 2—occasionally, and 3—frequently), and social support was coded from 0 to 5 (the higher the number, the greater the support). In all regression models, age was a control variable.

In the first regression for the entire sample, the dependent variable was SRH and the independent variables were religious affiliation, height, weight, level of schooling, religious involvement and social support, SES, smoking, one's children's health status, and reproductive effort (reproductive scheduling, birth spacing, duration of lifetime reproductive period, miscarriages, number of surviving children, lifetime breastfeeding in months, and health status of one's children). In the first step, the control variable age was entered in the model. The second step involved the inclusion of the religious affiliation, reproductive history variables, height and weight, level of schooling, SES, religious involvement and social support, smoking, and one's children's health status.

For Christian and Muslim Roma women regressions, the dependent variable was SRH and the independent variables were height, weight, level of schooling, religious

involvement and social support, SES, smoking, one's children's health status, and reproductive variables. In both regressions, in the first step, the control variable age was entered in the model while the second step involved the inclusion of the independent variables,

Results

Sample Descriptive

The sample consisted of 304 Roma women, with an average age of 53 (SD = 9.28). There were 177 (58. 2%) Christian and 127 (41.8%) Muslim Roma. The level of schooling for the entire sample was low: on average, a Roma woman went to school for 3.53 years (SD = 3.16). There were 2% divorcees and 5% widows; the rest were in marriages, mostly arranged but all endogamous within their own group.

Qualitative Findings

Most Roma women reported having "normal" (good) health, considering their age group and living conditions. Many Roma women who rated their health as "poor", blamed a "hard life" (that made them "sick"), regardless of religious affiliation. That is, just being a female for these women implied that one will have a much harder life (than any male), as females usually work much harder, worry much more about children, and have to mediate between their extended family members, and, for the most part, to manage in poverty. Many argued they have well learned the main female role: an ability to endure life's troubles, including poverty, without giving in. This also referred to their own health: "Women are never really sick. We may feel like crap, but there is no bed rest for me and not taking care of my family", explained a 48-year-old Muslim woman with four adult children and several grandchildren who are in her care most days. Another Roma woman, a 42-year-old with three adult children, opined: "When my kids were young, I used to catch everything my kids catch (in a cycle), but I don't remember that I ever allowed myself to be real sick", because, as she explained, her everyday family life would probably have fallen apart without her performing the usual daily duties and chores as a housewife, regardless of how sick she really felt. Other reasons for poor health included family disputes (10.2%), aging (5.4%) and being overweight (3.8%).

For the Roma women, the shared concern was their family life: constant worry about their family, especially children, even if they were grown-ups with their own families. Many said they would have chosen to have fewer children had they been given a choice (21% Muslim and 16.2% Christian women), simply because the endless concern, even in old age, is still giving them "nervosis" on a daily basis. Most women (almost 80%) perceived Roma females as having a subordinate status within the family because of "Roma traditions". A 39-year-old housewife explained it this way: "Husbands usually have much more support from both sides of families, and we have to obey, that's how we are brought up to be, to respect parents, in laws and

husbands, no matter what. Until we acquire a daughter in law—then I take command and she has to obey. Which is not so bad after all".

In contrast, a young woman (27) with two small children, one of the very few employed outside her home, argued that more and more the traditional Roma gender roles are fading: "We wanted to be equal (to men) and to be employed, and now we got it: I now have to work two jobs, as a mom and wife, and at my other work (as a cleaner), I have no one to watch over my kids, and I constantly worry about them".

Regarding decision making within a family, the women reported that most decisions were reached jointly by the husband and wife (44%), followed by husband only (28%) or in laws (13%), while 15% of women said their word is "the last one".

Differences by Religion

The socio-demographic, health and reproductive variables of the participants in the study are summarized in Table 1. Roma women were in their early 50 s, had attended school for a brief period and had average Roma SES. The majority were active smokers. First reproduction was relatively early, with subsequent births at every 2 years, while total breastfeeding (total months of lifetime breastfeeding) was extensive. Duration of reproductive period was 10 years, with age at last reproduction 27 years for the entire sample, while the number of surviving children was 4. Menopause (over 70% of women were menopausal) was relatively early, at an average age of 46.

When divided by religion, Roma women exhibit significant differences in age, schooling, SRH, all reproductive effort variables, and type of marriage, with mostly moderate to large differences (see Table 1). Thus, Muslim Roma women reported earlier age at first and later age at last reproduction, longer reproductive periods, longer birth spacing, higher fertility, more miscarriages, more intensive breastfeeding, poorer SRH, and poorer children's health than their Christian counterparts. Moreover, almost all Muslim Roma women were in arranged marriages and were also heavier than Christian women.

Additionally, Christian Roma women reported fewer incidences of diabetes (Chi-square test performed, Sig = 0.00, moderate difference) than Muslim Roma women. Christian and Roma women did not differ in SES, smoking habits, height, age at menopause or social support. Christian Roma women reported less religious involvement than Muslim women.

In the first regression (the entire sample), both models were statistically significant, implying that the control [$\chi^2(1) = 36.94$, $p = 0.00$] and independent variables [$\chi^2(16) = 134.11$, $p = 0.00$] contributed to the explanation of the dependent variable. Control variable—age—explained between 12.2% (Cox and Snell R^2) and 16.4% (Nagelkerke R^2) of the variance of the dependent variable. The second model, with the predictor variables, explained between 37.5% (Cox и Snell R^2) and 50.7% (Nagelkerke R^2) of the variance of the dependent variable. After correcting for the influence of the control variable, independent variables that explained self-reported poor health among Roma women were religious affiliation, children's health, duration of breastfeeding, duration of reproductive period and smoking

Table 1 Socio-demographic, health and reproductive variables of Roma women

	Christian $n=177$	Muslim $n=127$	Sig.	Total $n=304$	Cohen's *d*
Age (mean ± SD)	53.88 ± 9.65	51.51 ± 8.59	< 0.05[a]	52.90 ± 9.28	0.26
Education in years (mean ± SD)	3.89 ± 3.46	3.04 ± 2.63	< 0.05[a]	3.52 ± 3.3.16	0.28
SRH [*n* (%)]			< 0.05[b]		
Poor	62 (34.8)	65 (51.6)		127 (41.8)	
Good	116 (65.2)	61 (48.49)		177 (58.2)	
SES [*n* (%)]			> 0.05[b]		
Poor	66 (37.3)	52 (40.9)		118 (38.8)	
Average	97 (54.8)	67 (52.8)		164 (53.9)	
Above average	14 (7.9)	8 (6.3)		22 (7.2)	
AFR (mean ± SD)	17.63 ± 2.66	16.98 ± 1.67	< 0.05[a]	17.36 ± 2.31	0.29
ALR (mean ± SD)	26.51 ± 4.81	28.83 ± 5.17	< 0.05[a]	27.47 ± 5.08	0.46
Full pregnancies (mean ± SD)	3.54 ± 1.60	4.55 ± 1.99	< 0.05[a]	3.96 ± 1.84	0.55
No of children (mean ± SD)	3.47 ± 1.61	4.36 ± 2.25	< 0.05[a]	3.84 ± 1.95	0.45
Miscarriages (mean ± SD)	0.66 ± 1.37	1.31 ± 1.68	< 0.05[a]	0.93 ± 1.53	0.41
Birth spacing (mean ± SD)	2.50 ± 1.32	4.09 ± 4.01	< 0.05[a]	3.16 ± 2.88	1.70
Total breastfeeding mean ± SD	48.52 ± 36.97	62.08 ± 43.57	< 0.05[a]	54.18 ± 40.25	1.84
Duration of reproductive period mean ± SD	8.89 ± 5.07	11.18 ± 5.69	< 0.05[a]	9.84 ± 5.44	0.42
Children's health [*n* (%)]					
Poor	50 (28.2)	59 (46.5)	< 0.05[b]	109 (35.9)	
Good	127 (71.8)	68 (53.5)		195 (64.1)	
Height (mean ± SD)	159.94 ± 5.29	158.78 ± 4.97	> 0.05[a]	159.45 ± 5.18	0.23
Weight (mean ± SD)	64.76 ± 8.42	66.93 ± 8.23	< 0.05[a]	65.66 ± 8.39	0.26
Menopause (mean ± SD)	46.09 ± 2.93	45.77 ± 3.06	> 0.05[a]	45.96 ± 2.98	0.11
Type of marriage [*n* (%)]			< 0.05[b]		
Arranged	64 (36.2)	125 (98.4)		189 (62.2)	
Free	113 (63.8)	2 (1.6)		115 (37.8)	
Smoking [*n* (%)]					
Yes	133 (75.1%)	104 (81.9%)	> 0.05[b]	237 (78%)	
No	44 (214.9)	23 (18.1)		67 (22)	
Religious involvement	2.21 ± 0.91	1.77 ± 0.96	< 0.05[a]	2.03 ± 0.96	0.05
Social support	3.52 ± 1.67	3.84 ± 1.53	> 0.05[a]	3.65 ± 1.62	0.01

N number of observations, *SD* standard deviation, *sig*. signification

[a]*T* test was performed

[b]Chi-square test was performed

status (see Table 2). Islamic religious affiliation increased the possibility of poor health in comparison with women of Christian religious affiliation (OR = 8.62; 95% CI 3.62–20.53; $p = 0.00$). Women with healthy children had lower odds of poor health in comparison with women with sick children (OR = 0.36; 95% CI 0.14–0.91; $p = 0.03$). An increase in the duration of breastfeeding and reproductive period

increased the possibility of poor health (OR = 1.02; 95% CI 1.00–1.03; $p = 0.02$ and OR = 1.12; 95% CI 1.02–1.25; $p = 0.03$, respectively). Finally, being a smoker increased the possibility of poor health (OR = 4.04; 95% CI 1.70–9.60; $p = 0.00$), in regard to non-smokers. Age, the control variable, contributed in the same way as in the first model: an increase in age increased the possibility of poor health (OR = 1.26; 95% CI 1.15–1.30; $p = 0.00$).

In the second regression (Christian Roma women), both models were statistically significant. The first model ($\chi^2(1) = 39.52$, $p = 0.00$) with age as a controlled variable explained between 21.3% (Cox and Snell R^2) and 29.7% (Nagelkerke R^2) of the variance of the dependent variable. The second model [$\chi^2(15) = 80.11$, $p = 0.00$] with independent variables explained between 38.5% (Cox and Snell R^2) and 53.6% (Nagelkerke R^2) of the variance of the dependent variable. After correcting for the influence of the control variable, independent variable that explained self-reported poor health among Christian Roma women was children's health status. Women with healthy children had lower odds of poor health in regard to women with sick children (OR = 0.25; 95% CI 0.04–0.43; $p = 0.01$) (see Table 2). Control variable age was significant: an increase in age increased the possibility of poor health (OR = 1.18; 95% CI 1.16–1.39; $p = 0.00$).

In the third regression (Muslim Roma women), both models were statistically significant. The first model ($\chi^2(1) = 9.42$, $p = 0.00$) with age as a controlled variable explained between 7.3% (Cox and Snell R^2) and 9.7% (Nagelkerke R^2 of the

Table 2 Roma women regression models: predictors of SRH

Variables in the equation	Roma women entire sample	Christian Roma women	Muslim Roma women
	Exp (*B*)	Exp (*B*)	Exp (*B*)
Age	1.259*	1.182*	1.093*
Religious affiliation	8.616*		
Level of schooling	0.959	1.018	0.811
Weight	0.989	1.040	0.971
Height	1.048	1.049	1.053
Number of children	0.955	1.060	0.777
Miscarriages	1.036	1.044	1.102
Birth spacing	1.024	1.015	0.875
Healthy children	0.359*	0.253*	1.470
Breastfeeding total	1.015*	1.053	1.086*
Reproductive period	1.124*	1.054	1.121*
Smoking	4.037*	1.363	2.864
SES (1)	1.849	1.700	0.633
SES (2)	2.232	1.036	3.237
Religious involvement	1.445	1.687	1.170
Social support	0.855	0.920	0.805
Constant	0.000	0.000	0.000

Significant at $\alpha = 0.05$

variance of the dependent variable. The second model [$\chi^2(15) = 39.61$, $p = 0.00$] with independent variables explained between 27.2% (Cox и Snell R^2) and 36.2% (Nagelkerke R^2) of the variance of the dependent variable. After correcting for the influence of the control variable, independent variables that explained self-reported poor health among Muslim Roma women were duration of reproductive period and breastfeeding. An increase in the duration of reproductive period and breastfeeding increased the possibility of poor health among Muslim Roma women (OR = 1.12; 95% CI 1.08–1.23; $p = 0.02$ and OR = 1.09; 95% CI 1.01–1.17; $p = 0.04$, respectively). The control variable, age, contributed in the same way as in the first model: an increase in age increased the possibility of poor health (OR = 1.09; 95% CI 1.00–1.19; $p = 0.04$).

Discussion

To the best of knowledge, this is the first study that investigated the potential health differentials between Muslim and Christian Roma women living in Serbia with regard to reproductive effort. The present study found an association between Roma women's religious affiliation and health outcome. Muslim Roma women were more likely to experience poor health than Christian Roma women. In addition to religious affiliation, longer duration of breastfeeding and longer reproductive periods, having a sick child, older age and smoking status increased the risk of poor health for Roma women. When the sample was divided into Christian and Muslim women, children's health status (having a sick child) and older age increased the risk of poor health among Christian Roma women, while for Muslim women, longer duration of breastfeeding and reproductive period, and older age explained poor health. SES, level of schooling, social support and religious involvement, height and weight, birth spacing, miscarriages, and number of surviving children were not significant in regard to the self-rated health of these women.

The reproductive pattern of Muslim Roma women may predispose them to risk factors for chronic diseases. No significant differences in height were observed between Christian and Muslim Roma women, implying that that these two groups of women had similar health at the beginning of their reproductive career, but they differ in their health status in older age as result of differences in reproductive investment. Thus, Muslim Roma women had longer reproductive periods (earlier age at first and later age at last reproduction), higher fertility, more miscarriages, more intensive breastfeeding, and poorer children's health than their Christian counterparts.

These findings are consistent with studies that have shown that increased reproductive effort is physically challenging and may have deleterious effects on a woman's health; this association may represent a biological response to pregnancy and accompanying physiological changes (Spence 2008; Ziomkiewicz et al. 2016; Atsma et al. 2008; Feng et al. 2008). The timing of reproduction can generate costs that affect different aspects of maternal health (and fitness), i.e., repeated reproductive events may negatively affect maternal health, especially at older age (Gurven et al. 2016; Jasienska 2017). Furthermore, a number of health studies of contemporary

populations have also reported long-term unfavorable health effects associated with late childbirth, regardless of early life conditions, current socioeconomic position, or support from adult children (Alonzo 2002; Spence 2008; but see Helle et al. 2005; Mueller 2004). Cumulative costs of lactation is a very important variable in calculations of total reproductive effort because, on average, 1 day of lactation places higher demands on maternal energetics than 1 day of pregnancy (Jasienska 2009). Lactation, along with pregnancy, increases the risk of oxidative stress (Agarwal et al. 2005).

This study's findings are indicative of the significance of differences in the health of women affiliated to different religions, suggesting that understanding of health differentials can account for the effect of gender and religion (Karlsen and Nazroo 2010; Williams et al. 2010).

Other variables that contributed to an increased risk of poor health among Roma women were children's health status, older age and smoking. In addition to the direct costs of reproduction, there are also significant indirect costs associated with childcare which could be especially significant in childcare of sick children, eroding maternal health over time (Benson 2017; Miodrag et al. 2015; Miodrag and Hodapp 2011). In line with these findings, Roma mothers who raised healthier children reported better health than mothers with sick children. Age is a well-known factor associated with an increased risk of a range of major chronic diseases; on average, self-reported health is better for non-smokers and among younger populations (Sargent-Cox et al. 2014; Wu et al. 2013).

Finally, several limitations of this study should be noted. The overall findings of this study do not rule out the possibility that within other groups, given the heterogeneity of the Roma, the associations may differ from the ones observed here. Considering the Roma universal early age of marriage and reproduction, Roma women become grandmothers at a relatively early age and are expected to help in childcare, but the investment in grandchildren, which may also affect the internal view of health, was not accounted for in this study. Also, data on contraception were not collected, but in previous studies, as in this one, the average age at last reproduction for Roma women was in their late 20 s, which corresponds to the official data (Čvorović and Coe 2017). This indicates that Roma women have found ways to limit their family size after a certain number of children was achieved. Furthermore, no difference in socioeconomic status between Christian and Muslim Roma mothers were found, but this variable, as well as others, was self-reported and thus may have affected the finding. Additionally, data on specific religious behaviors, such as holiday fasting, which may lead to negative health consequences (Savitri et al. 2014), were not collected. Future studies should not only include these but also a set of other questions of religion-related health differences among Serbian Roma, both women and men. Lastly, as this was a volunteer sample, it may have been subject to some self-selection.

In spite of these limitations, the present study of religion-associated differences in health outcomes among Roma women represents "a paradigm shift" with regard to traditional health differences research, which has been mainly focused on the factors of race, ethnicity, or socioeconomic status (Laird et al. 2007; Padela and Curlin 2013; Gyimah 2007). These results are therefore informative to service providers

and practitioners who should be aware of religious differences in women's health outcomes caused by differential reproduction.

Conclusion

Reproductive effort is costly and, in a traditionally female-dependent childcare culture such as that of the Roma, the costs of reproduction are higher for Muslim Roma women, who engaged in extended reproductive effort. This finding supports a role of religious affiliation in health differentials generally.

Motherhood represents a major focus of most Roma women's lives and whether the long-term implication of motherhood has negative or positive effects on health in later life is likely to depend both on the fertility pathways taken and on the context in which these take place (Grundy and Tomassini 2005). In turn, a woman's religious affiliation may influence the type and timing of marriage, childbearing practices, and desired family size, as well as a number of other health decisions faced on a daily basis (Gaydos et al. 2010). Even in less traditional settings than a Roma community, women's religious affiliation and self-assessed religiosity are strongly related to fertility (Buber-Ennser and Skirbekk 2016).

It has been suggested that a major mechanism shaping the relationship between religion and fertility is the effect of some religious systems on reinforcing family values and segregated gender roles (Goldscheider 2006). Throughout Europe, various survey data show that Muslim women are more religious and more committed to traditional family values than non-Muslim women and that religiousness is directly associated with fertility (Westoff and Frejka 2007). Demographic behavior is thus influenced because Islam is more strongly patriarchal than other religions (Caldwell 1986). Nevertheless, across several Asian countries, previous research on Muslim and non-Muslim differences found very weak evidence for a link between religion and women's autonomy, and no evidence at the individual level that women's autonomy was associated with fertility measures or different socioeconomic levels (Morgan et al. 2002). Rather, demographic differences were linked to group identity and political disadvantage, whereas identity issues that justify differences arose from group competition and conflict.

In multi-ethnic and multi-religious societies competition may take various forms between different followers/groups over territory, the control of which traditionally facilitated reproduction and development of cultural and economic traditions (Dunn 2015; Onapajo and Usman 2015; Čvorović 2004). Competition does not have to be violent; e.g., competitors may simply outbreed each other (Wilson 1975). Among minority groups especially, aspects of religion and ethnicity, and, in the Roma case, group division, clearly overlap (Beckford et al. 2006).

Serbian Roma created a mix of cultures from two different cultural systems, Islam and Orthodox Christianity, prescribing traditional behavior for both Muslim and Christian Roma. It is likely that the group differences have been deepened by competition for resources and territory and further consolidated by cultural and linguistic divergences. For both groups, cultural, i.e., religious, forces influenced

differences in terms of marriage practices and reproductive behavior, and, among women, differences in health outcomes.

Among the Roma, both Christian and Muslim, religion may be identified as an important determinant of reproductive and fertility patterns largely because religion forms a central component of the cultural identity of its followers (McQuillan 2004). Therefore, the role played by religion in the study of contemporary fertility and health differentials should not be undervalued (Philipov and Berghammer 2007; Padela and Curlin 2013).

Compliance with Ethical Standards

Conflict of interest The authors declare that there is no conflict of interest.

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