

Psychosocial Stress, Course of Pregnancy and Pregnancy Outcomes in the Context of the Provision of Sexual Services

Psychosoziale Belastungen, Schwangerschaftsverlauf und -outcome im Kontext sexueller Dienstleistungen

Authors

Elisabeth Simoes^{1,2,3}, Johannes Gostomzyk⁴, Sara Yvonne Brucker^{1,2}, Joachim Graf^{1,2}

Affiliations

- 1 Department für Frauengesundheit, Universitätsklinikum Tübingen, Tübingen, Germany
- 2 Forschungsinstitut für Frauengesundheit, Universitätsklinikum Tübingen, Tübingen, Germany
- 3 Stabsstelle Sozialmedizin, Universitätsklinikum Tübingen, Tübingen, Germany
- 4 Gesundheitsamt Augsburg, Ltd. Medizinaldirektor a. D.

Key words

prostitution, Prostitute Protection Act, high-risk pregnancy, sexual violence, preterm birth

Schlüsselwörter

Prostitution, Prostituiertenschutzgesetz, Risikoschwangerschaft, sexuelle Gewalt, Frühgeburtslichkeit


received 25. 8. 2016
revised 15. 11. 2016
accepted 16. 12. 2016

Bibliography

DOI <http://dx.doi.org/10.1055/s-0042-124045>
Geburtsh Frauenheilk 2017; 77: 366–376 © Georg Thieme Verlag KG Stuttgart · New York | ISSN 0016-5751

Correspondence

Joachim Graf, M.A.
Department für Frauengesundheit, Universitätsklinikum Tübingen
Calwerstraße 7, 72076 Tübingen, Germany
joachim.graf@med.uni-tuebingen.de

 Deutsche Version unter:
<http://dx.doi.org/10.1055/s-0042-124045>

ABSTRACT

Introduction There has been very little medical research into pregnancies which occur in the context of prostitution, even though the associated health risks for mother and child, e.g. violence or maternal drug abuse, are well known. The aim of this study was to compile and summarize what is known (inter-)nationally about this topic and identify key points of support as part of a uniform standard of healthcare in pregnancy.

Material and Methods A selective search of the literature was done in Pubmed and Livivo/Medpilot and in the databases NIH, Cochrane, DARE, NHSEED and HTA on the factors influencing preterm delivery.

Results There are no systematic studies on pregnancy risks in the context of sexual services. But there is data available on specific risk factors, for example the increased risk of prematurity associated with sexual/physical violence (OR = 1.28–4.7). The Prostitute Protection Act provides only limited protection for affected women, and statutory maternity protection regulations also have little impact as they require a formal contract of employment which rarely exists even in the context of legal prostitution.

Conclusion Approximately 400 000 women are currently working as prostitutes in the Federal Republic of Germany. The number of unreported cases is high. Nevertheless, there is little concrete data available on the probable health risks if these women become pregnant. The existing laws that should offer protection fall short of the mark. There is a need for more research into the future implementation of the Prostitute Protection Act which should focus on health counseling, health promotion and additional protective legislation. Low-threshold healthcare services offered in the context of prenatal care could be an opportunity to improve care.

ZUSAMMENFASSUNG

Einleitung Schwangerschaft im Kontext von Prostitution gehört zu den bisher kaum fokussierten Forschungsthemen der Frauenheilkunde, obwohl hier Gesundheitsrisiken bspw. durch Gewaltexposition oder Drogenabusus für Mutter und Kind vorliegen. Ziel der Arbeit ist es, den (inter-)nationalen Wissensstand zusammenzutragen, um Eckpunkte für die Gesundheitsförderung in Richtung eines einheitlichen Gesundheitsschutzniveaus in der Schwangerschaft zu identifizieren.

Material und Methoden Eine selektive Literaturrecherche erfolgte in PubMed und Livivo/Medpilot sowie zu den Einflussfaktoren von Frühgeburtslichkeit über die Datenbanken NIH, Cochrane, DARE, NHSEED und HTA.

Ergebnisse Systematische Studien zu den Schwangerschaftsrisiken im Kontext sexueller Dienstleistungen fehlen. Wohl bestehen aber Erkenntnisse zu einzelnen gesundheitsgefährdenden Faktoren z.B. einem erhöhten Frühgeburtsrisiko durch sexuelle/physische Gewalt (OR = 1,28–4,7). Die Möglichkeiten zum Schutz von Betroffenen im Rahmen des Prostituiertenschutzgesetzes sind begrenzt, auch die Wirkungen des gesetzlichen Mutterschutzes, da ein formales Dienstverhältnis Voraussetzung ist, das auch bei legalisierter Prostitution i. d. R. nicht vorliegt.

Schlussfolgerung Etwa 400 000 Frauen sind in der BRD in der Prostitution tätig. Die Dunkelziffer ist hoch. Dennoch fehlt konkretes Wissen zu den gesundheitlichen Gefährdungen im Fall einer Schwangerschaft. Bisherige Schutzregelungen greifen zu kurz. Forschungsbedarf besteht mit Blick auf die zukünftige Umsetzung des Prostituiertenschutzgesetzes bezüglich Gesundheitsberatung, -förderung und erweiterter Schutzregelungen. Chancen bieten niedrigschwellige Angebote im Rahmen der Schwangerenvorsorge.

► **Table 1** The search for data on pregnancies and pregnancy outcomes in the context of sexual services.

Search term	Hits	Applicable studies
PubMed (12.05.2016; no limitation to the search period)		
preterm birth/premature birth/preterm delivery AND prostitution	2	1
(prostitution [title/abstract]) AND pregnancy [title/abstract]	81	2
rape AND premature delivery	6	3
sexual violence AND premature delivery	21	7
rough intercourse AND premature delivery	0	0
sexually transmitted diseases AND pregnancy	21 218	
▪ (sexually transmitted diseases [MeSH Terms]) AND pregnancy [MeSH Terms]	18 590	
▪ ((prostitution [MeSH Terms]) AND sexually transmitted diseases [MeSH Terms]) AND pregnancy [MeSH Terms]	176	
▪ ((prostitution [MeSH Terms]) AND sexually transmitted diseases [MeSH Terms]) AND unborn child [MeSH Terms]	0	
▪ ((prostitution [MeSH Terms]) AND sexually transmitted diseases [MeSH Terms]) AND risk for pregnancy [MeSH Terms]	100	
Livivo/Medpilot (12.05.2016; no limitation to the search period)		
premature delivery AND prostitution	6	5
rough intercourse AND premature delivery	0	0
rape AND premature delivery	3	1
sexual violence AND premature delivery	21	5

Introduction

There has been very little research into pregnancies which occur in the context of prostitution. However, a lot of information is available on factors and conditions which, taken individually or together, can have an unfavorable impact on the course of pregnancy and its outcome. Many of these factors are also typically found, to a greater or lesser degree, in the context of sexual services. They include, among other things, psychosocial stress and exposure to violence. The discussion around the Prostitute Protection Act (ProstSchG) in Germany [1] has focused attention on pregnancies and prostitution. What do we know, nationally or internationally, about pregnancies which occur in the context of prostitution? This study aimed to consider this question from a gynecological and socio-medical perspective with a special focus on the risks for the pregnancy and on the statutory protection offered to pregnant women. The goal was to identify *key principles* which could promote the health of the mother and the child. This was all the more necessary in view of the fact that pregnancies which occur in the context of prostitution are not rare: in the study by Feldblum et al., 250 of 935 prostitutes became pregnant during the observation period of 18 months; in 51% of cases, the pregnancy was continued to delivery [2]. Duff et al. reported that, because of their work as prostitutes, the average lifetime prevalence for pregnancies was 4 per woman for drug-addicted prostitutes. 45% of the women they studied had had at least one miscarriage [3]. It is assumed that the number of unreported cases is much higher [4, 5]. This study on women's health looked at the many different health risks associated with prostitution during pregnancy to which both the mother and the unborn child may be exposed because of the maternal environment. The question

was whether it would be possible to quantify the specific risks for pregnancy arising from the increased risk of infection with HIV, HCV, HPV or bacterial infections, resulting from drug abuse or violent sexual intercourse. The study also wanted to answer the question whether there was any data on the possible correlation between frequent sexual intercourse in the context of prostitution and preterm birth and whether any studies had differentiated their findings according to the week of gestation.

Material and Methods

In order to present the current state of research on pregnancies and pregnancy outcomes in the setting of sexual services, a selective literature search was done in PubMed and Livivo/Medpilot (date of access: 12.05.2016; ► **Table 1**). A further search was done, primarily in the MEDLINE database of the NIH (PubMed), the Cochrane Databases and the databases DARE (the Database of Abstracts of Reviews of Effectiveness/abstracts of quality assessed systematic reviews), NHSEED (NHS Economic Evaluation Database/economic evaluations of health care interventions) and HTA (Health Technology Assessment database/publications and projects by INAHTA and other HTA organizations), into the factors influencing preterm birth, which was defined as an unfavorable pregnancy outcome strongly associated with neonatal morbidity. Using previously identified studies, the search was then expanded manually using Google and the websites of specialist journals, etc. An internet-based search was also carried out into legal regulations on sexual services. Another search was done into the legal and statutory regulations and provisions for maternity protection and social security benefits during pregnancy. The term "pregnancy risks" included all risks associated with the mother's medi-

cal history and all atypical findings recorded in the maternal health passport based on the specifications of the German Maternity Guidelines (guidelines on the medical care which should be offered during pregnancy and after delivery) of the Federal Joint Commission.

Results

Sexual services and the associated threat to pregnancy

The single-digit figure obtained in our search for scientific publications on the potential risks to pregnancy occurring in the context of providing sexual services point to the previous neglect of this topic in international research. There are no international studies investigating the impact of an **adult woman** providing sexual services while pregnant on the course and outcome of the pregnancy or the impact on the mother and child. Scientific research on this topic is urgently needed.

In Germany the prostitution of women under the age of 18 is illegal.

There are only a few studies, all of them from outside Germany, on girls under the age of 18 who are illegally groomed into offering sexual services, for example the study by Deisher et al. from the USA (1991, ► **Table 2**). These studies describe an accumulation of risks which include *lack of medical care, nutrition and social inclusion; violence; alcohol abuse; drug consumption; prescription drug abuse; and recurrent sexually transmitted diseases*. The authors reported increased rates of preterm delivery (22%), low birth-weight newborns (24%) and neonates with low Apgar scores ≤ 7 (35%) for these young high-risk pregnant women.

A similar **accumulation of risks**, each one of which represents a significant threat to the pregnancy, must also be assumed for prostitutes of legal age. But systematic studies on pregnancy risks and their impact on adult prostitutes are lacking.

The only means of estimating the potential threat is to look at **different factors and conditions** which are known to have a negative impact on pregnancy. Conditions which commonly occur in the context of providing sexual services and their impact are discussed below, although the data does not only pertain to women who work as prostitutes.

Lack of medical care and social inclusion

Perinatal data have shown that under-utilization of prenatal care not only increases the rate of preterm births (delivery prior to the end of the 37th week of gestation), it also increases neonatal morbidity and the rate of obstetrical complications (severe bleeding, hysterectomy post partum). Pregnant women suffering under (psycho)social stress are less likely to avail themselves of prenatal care services. Perinatal data collected in the German federal state of Baden-Württemberg showed that the pregnancy risk referred to as “additional social burdens”, a risk which is entered into the pregnant woman’s maternal health records, increases the relative risk of foregoing prenatal care (number of prenatal care appointments attended 0–1) to 11.69 (95% confidence interval [95% CI]: 8.77–15.58); the relative risk (RR) associated with the woman’s

status as a foreigner (unmarried) has been calculated as RR: 5.12 (95% CI: 3.11–8.46) [6].

Unfavorable socio-economic conditions such as low level of education (OR: 1.75; 95% CI: 1.65–1.86), status as a single mother (OR: 1.61; 95% CI: 1.26–2.07) and young age (< 18 years old, OR: 1.70; 95% CI: 1.02–3.08) increase the risk of preterm delivery [7]. Even uncertainty about one’s socio-economic position can be associated with insufficient intrauterine fetal development [8]. When the legal status regarding the right of residence of a pregnant woman offering sexual services is unclear, this existential insecurity can have a negative impact on her mental health, in addition to the already existing high rate of mental health problems (e.g. depression) found among women prostitutes [9]. (Psycho-) social factors affect the course of pregnancy, have an impact on birth complications and also influence the rate of cesarean sections [10]. Anxiety must be rated as a key factor [11–13]. According to the case-control study by Zhao and Chen, the number of women who had a cesarean section and suffered from depression was twice as high as the rate of women suffering from depression who had a vaginal delivery (36.8 vs. 18.07%; $p < 0.005$). Adverse socio-economic conditions were also found to be more common in the first cohort of women (e.g., risk of poverty: 13.3 vs. 3.4%; $p < 0.005$). In women suffering from an anxiety disorder the calculated OR for cesarean section was 34.8 [13]. Maternal anxiety and stress during pregnancy have a long-term effect on the child, which extends far into the child’s later life and affects the child’s cognitive development (cf. [14–16]).

Violence, fear, stress

Violence against a pregnant woman may be direct, taking the form of mechanical impact, and indirect, in the form of triggering stress and physical reactions to stress, and both may constitute a threat to the pregnancy (cf. [17, 18]). According to Neggers et al., the OR after experiencing a physical assault is 1.6 for preterm birth and 1.8 for low birth weight [17]. Activity-related stress can negatively affect the pregnancy in many ways; the risk for preterm delivery and low birth weight is increased for women experiencing *excessive* physical and psychological strains in the context of work [19]. Sexual and physical violence – which women who offer sexual services may be subjected to in varying degrees and forms [20, 21], also in Germany [22] – increases the risk of preterm delivery. Here again, pregnancy studies which *explicitly* looked at prostitution are lacking. But there are studies of women who were subjected to violence (e.g. by their partner) during pregnancy, which, even though the studies were undertaken in a number of different countries, all found similarly high risks (► **Table 2**). If women suffer both emotional *and* physical violence during pregnancy, they have a 4.7 times higher risk of preterm delivery (Sanchez et al. 2013, ► **Table 2**). There are also studies which have shown the risk of suffering a miscarriage (loss of the pregnancy in the first 24 weeks of gestation) and the incidence of high-risk pregnancies. Studies from several different countries (► **Table 2**) have shown that the probability of suffering a miscarriage increases when the pregnant woman suffers sexual violence, although the studies looked at different manifestations and conditions. The situation of prostitutes was not studied separately. Satin et al. (1992) calculated that the prevalence of pregnancy complications requiring

Table 2 Violence and pregnancy outcome. The table provides an overview of the increased risk of an unfavorable pregnancy course and outcome created by (sexual/physical) intimate partner violence against their pregnant partners, expressed as an odds ratio, and of the relative risk based on studies carried out in different countries. Premature delivery: delivery before the end of the completed 37th week of pregnancy; miscarriage: before the completed 24th week of pregnancy.

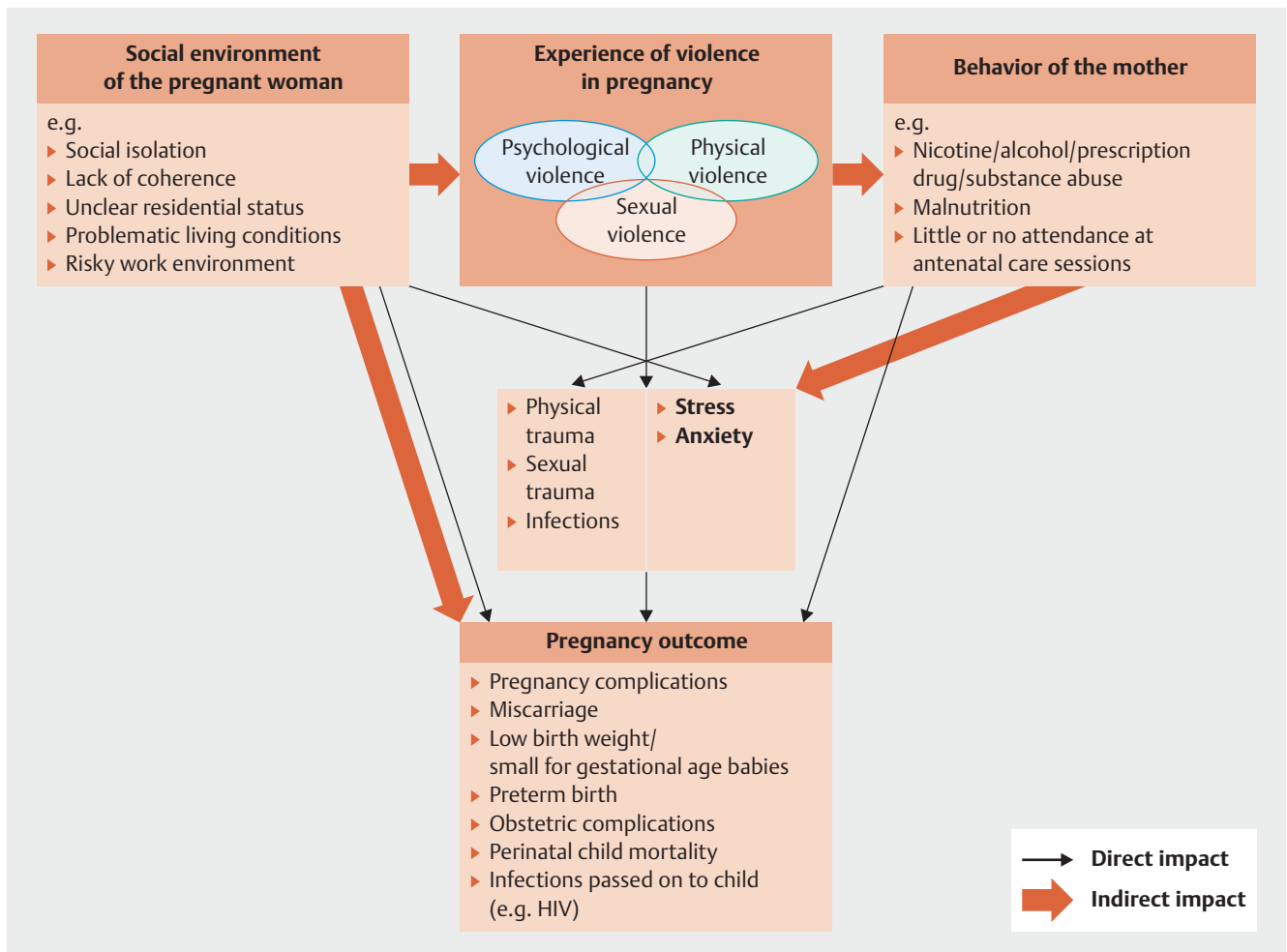
Source	Henriksen et al. (2014) [44]	Nur (2014) [45]	McDougal et al. (2013) [46]	Stocklet al. (2012) [47]	Sanchez et al. (2013) [48]	Johri et al. (2011) [49]	Sarkar (2008), meta-analysis [50] Silverman et al. (2007) [51]	Kaye et al. (2006) [52]	Coker et al. (2004) [53]	Satin et al. (1992) (abstract) [54]	Deisher et al. (1991) [55]
Investigated area/country	Norway	Turkey	Mexico	Tanzania	Peru	Guatemala	Bangladesh	Uganda	USA	USA	USA
Number of cases	n = 76870	n = 1221	n = 582	n = 2492	n = 959	n = 1897	n = 2677	n = 612	n = 755	n = 2404	n = 54
Age distribution	< 20: 1.5%; 20–24: 12.2%; 25–29: 36.2%; 30–34: 35.7%; > 35: 14.4%	included in the study: women aged 15–49 years; 15–24: 12.4%; 25–34: 28.5%; > 35: 59.0%	included in the study: women > 18 years; mean age: 33 years	15–19: 6.1%; 20–34: 61.96%; 35+: 31.94%	case group: < 20: 8.8%; 20–29: 49%; 30–34: 19.6%; > 35: 22.7%	women aged 15–47 years	women aged 13–40 years	n. a.	women aged 18–65 years	n. a.	women aged 14–20 years
Study design	cohort study	longitudinal cohort study	behavioral intervention study	cohort study	case-control study	cross-sectional study	longitudinal cohort study	prospective cohort study	cross-sectional study (retrospective)	n. a.	retrospective study based on patient data
Patient cohort	pregnant women	married women living in the Turkish region of Sivas	drug-addicted prostitutes	pregnant women	women whose baby was born alive	pregnant women	married women	pregnant women in the 3rd trimester of pregnancy	women treated by their family doctor in 1997–1998	puerperal women	prostitutes who gave birth from 1987–1989 in Seattle
Study objectives	impact of low-level, medium level and serious violence on pregnancy outcomes (IPV)	correlation between domestic violence and miscarriage	prevalence of miscarriages in drug-addicted prostitutes	impact of sexual violence (IPV) on pregnancy outcomes	impact of IPV on premature delivery	impact of IPV on miscarriage	impact of IPV on pregnancy outcomes	impact of IPV on the risk of low birth weight and pregnancy complications	correlation between IPV (physical and psychological) and pregnancy outcomes	impact of sexual violence (lifetime prevalence) on pregnancy outcomes	description of the factors affecting the pregnancy and neonatal outcome
Type of violence investigated	sexual violence	sexual and/or physical violence	sexual violence	sexual and/or physical violence	physical violence	sexual and/or physical violence	sexual and/or physical violence	domestic violence	physical violence	sexual violence	sexual and/or physical violence

Continued next page

► **Table 2** Violence and pregnancy outcome. The table provides an overview of the increased risk of an unfavorable pregnancy course and outcome created by (sexual/physical) intimate partner violence against their pregnant partners, expressed as an odds ratio, and of the relative risk based on studies carried out in different countries. Premature delivery: delivery before the end of the completed 37th week of pregnancy; miscarriage: before the completed 24th week of pregnancy. (Continued)

Dependent variables																				
Premature delivery	OR = 1.28	-	-	RR = 2.1	-	-	-	OR = 1.45	RR = 1.7	-	-	-	-	-	-	-	-	-	22%	
Additional emotional violence	-	-	-	RR = 4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Low birth weight	OR = 1.29	-	-	-	-	-	-	RR = 3.8	RR = 2.0	-	-	-	-	-	-	-	-	-	-	
Premature delivery and low birth weight	-	-	-	-	-	-	-	-	RR = 2.4	-	-	-	-	-	-	-	-	-	-	
Small for gestational age (SGA)	OR = 1.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Perinatal fetal morbidity	-	-	-	-	-	-	-	-	RR = 2.1	-	-	-	-	-	-	-	-	-	-	
Miscarriage	-	OR = 2.47	OR = 1.7	RR = 1.6	-	OR = 1.1-2.8	OR = 1.81	-	-	-	-	-	-	-	-	-	-	-	-	
High-risk pregnancy, pregnancy complications	-	-	-	-	-	-	OR = 1.43-1.69	RR = 1.37	-	-	-	-	-	-	-	-	-	-	increased from 8 to 15%	
Unwanted pregnancy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Abortion	-	-	OR = 3.7	RR = 1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Specialities, additional aspects	prevalence of violence: 18.4%	10% physical violence; 6.2% sexual violence; 6.4% miscarriage; the rate of miscarriages was twice as high for women who experienced violence during pregnancy	51% sexual violence; 49% physical violence; 30% miscarriage	50% experienced violence; 23% miscarriage; 7% abortion	case group: n = 480; control group: n = 479	IPV: 18% (psychological: 16%; physical: 10%; sexual: 3%); miscarriage: 10%	IPV in 3/4 of investigated women was significantly correlated with socioeconomic status	-	-	IPV rate 14.7%	-	-	-	-	-	-	-	-	-	-

IPV = intimate partner violence, - = no information



▶ **Fig. 1** Risk factors for pregnancy outcomes following violence during pregnancy, including in the context of sexual services (modified from Coker et al., 2004). The resulting risk potential varies on a case-by-case basis.

hospitalization was 15% for women who had suffered violence compared to 8% among women with no experience of sexual violence (▶ **Table 2**).

▶ **Fig. 1** illustrates the accumulation of risks occurring through the interaction between exposure to violence and other potential risk factors. It is postulated that all three forms of violence are found in the setting of prostitution.

Alcohol abuse, tobacco and drug consumption, risk of infection

Drug use and its consequences do not just endanger the mother and the fetus in utero through the transplacental exposure to drugs, the harm to the child also continues post partum in dysfunctional mother-child interactions and postnatal adjustment and maturation processes. It is well-known that the extent of this negative impact differs depending on the type of drug consumed by the mother (cf. [23]). Fetal alcohol syndrome due to maternal alcohol consumption during pregnancy is well documented. Maternal smoking and even maternal exposure to tobacco smoke can harm the unborn child [24]. The risk of preterm delivery is increased for women who smoke (OR: 1.7; 95% CI: 1.3–2.2) [25];

drug, alcohol and tobacco consumption are often associated with poor and insufficient nutrition, creating an additional strain. Drug abuse is very common in the setting of prostitution: the prevalence of alcohol abuse among Belgian prostitutes was reported to be 88.4%. During the survey, 18–20% reported that they had consumed cannabis, cocaine or benzodiazepines in the past few weeks [26].

Persons working as prostitutes have a high risk of infection for all sexually transmitted diseases (hepatitis B: 8.5%; HIV: 0.2%; syphilis: 1.8%; gonorrhea: 1.8%; chlamydia: 4.6%) [27]. The association between ascending infections of the vagina and preterm delivery is well documented [28, 29]. An untreated HIV infection represents a particular risk during pregnancy and for the neonate. Local co-infections such as trichomoniasis, chlamydia infections and bacterial vaginosis are correlated with an increased risk of HIV transmission [30].

Prostitution and pregnancy in the context of social security laws

The Prostitution Act

The Prostitution Act was passed in Germany in 2002. Before the passing of the Act, prostitution in Germany was considered to be violating social mores [31]. With the passing of the Act, Germany became one of the countries which permit a legalized regulated prostitution based on a concept of decriminalizing prostitutes [32–34]. How the Act itself is implemented across Germany differs from federal state to federal state [35].

Statutory regulations for the legal protection of working mothers

Statutory maternity rights aim to protect the (expectant) mother and fetus from hazards, excessive demands and damage to their health *in the workplace*, and to protect the mother from financial losses and the loss of her job during pregnancy and for a certain period of time after giving birth [36]. In Germany, the Maternity Protection Act (MuSchG) [37] applies to all (expectant) mothers in regular contractual employment who pay compulsory health insurance; it also covers women working only limited hours and women in vocational training. In addition to a general period of protection, the Maternity Protection Act imposes certain employment bans (for example, heavy physical labor which could endanger the mother's health) as well as specific individual bans on employment, depending on the hazards inherent in the specific employment which must be documented in a medical certificate. A number of maternity benefits are available to protect non-working pregnant women in this period from suffering financial hardship; these include statutory maternity pay, the employer's contribution to the maternity pay during the period of maternity leave, and compensation for employment bans outside the period of statutory maternity leave (also known as maternity protection pay).

The **Ordinance for the Protection of Mothers in the Workplace** (MuSchArbV) includes additional regulations which aim to safeguard the health of expectant mothers and protect them from hazards, overwork and exposure to hazardous materials in the workplace [38]. In case of doubt, the respective supervisory authority* is responsible for deciding whether the specific workplace and the specific working conditions present a risk for mother and child. There are a number of additional protective regulations which have been enshrined in other statutes, including Book V of the Code of Social Insurance Code (SGB V), the Workplace Ordinance (ArbStättV), and the Hazardous Substances Ordinance (GefStoffV), and various regulations have been passed by different German federal states.

But this careful framework of regulations designed to safeguard the health of pregnant women and provide financial pro-

tection during pregnancy often does not work for pregnant prostitutes, as the overwhelming majority of prostitutes are not in contractually regulated employment [39]. The Maternity Protection Act does not apply to self-employed women or housewives.

Social protection

Pregnant women with medically unremarkable pregnancies are considered fit for work as defined in Book II of the Social Insurance Code (**SGB II**) (basic provisions for jobseekers) and Book III of the Social Insurance Code (**SGB III**) (promotion of employment). According to Book XII of the Social Insurance Code (**SGB XII**), the purpose of social welfare payments is to allow persons entitled to these benefits to lead a life which is commensurate with their human dignity. But social welfare payments are *secondary* to other means of income and other entitlements to benefits, even in EU law. Social welfare payments as defined in SGB XII can also include maintenance support, basic support in the event of reduced earning capacity and **support for health, in pregnancy and in early motherhood** as well as support in special circumstances, *if this support is applied for and the conditions of need defined in the Act are met*. Section 23 states the conditions regulating the payment of welfare benefits to non-German residents. Some women working as prostitutes have health insurance coverage and statutory or private health insurance (**SGB V**) from some other form of employment. In some cases, the expectant mother is entitled to antenatal care as defined in the Maternity Guidelines of the Federal Joint Committee and may receive maternity benefits in accordance with the guidelines of her respective health insurance company.

The role of the gynecologist

Physicians, specifically gynecologists, play a key role in ensuring that expectant mothers are protected, and the key role of physicians is set out in the statutory regulations. Physicians are not just responsible for ascertaining the pregnancy and caring for the expectant mother as outlined in the Maternity Guidelines but are also responsible for certifying any pregnancy-related incapacity for work or imposing individual bans on employment. The physician's knowledge of pregnant women's right to claim welfare benefits and their knowledge of counselling services not otherwise known to pregnant women (see below) [40] and the passing on of this information to expectant mothers is equally important – particularly for women not covered by standard statutory health regulations and women with limited health literacy.

Responsibilities of public health services

The Infection Protection Act (IfSG) of 2001 describes the care responsibilities of the public health services with regard to prostitution. The guiding principle of the IfSG – “prevention through education” – fundamentally changed the way in which public health authorities worked. They now offer voluntary counselling to target groups. Counselling may also be offered through proactively seeking out a target group (e.g. street work). In recent years, the number of contacts between the public health authorities and prostitutes and the frequency in which prostitutes were contacted decreased significantly, possibly because counselling was offered on a voluntary basis. The new Prostitute Protection Act passed by

* Mutterschutz und Kündigungsschutz: Aufsichtsbehörden in Baden-Württemberg, [Maternity Protection and Protection against Dismissal: Supervisory Authorities in Baden-Württemberg] as per August 2015: compliance with the provision of the Maternity Protection Act is monitored by the respective regional councils.

the Bundestag on July 7th, 2016, was expanded from 3 to 38 paragraphs compared to the Act of 2002. It has introduced a number of new provisions which also affect the public health authorities. In addition to the obligation for prostitutes to register, the new Act also includes compulsory annual health counselling (to be provided by the local public health department or other yet to be named institutions) and the protection of health and safety by the requirement that facilities and persons involved in facilitating the sex trade must comply with certain minimum standards.

Advice offered during counselling is based on the premise that prostitution is associated with significant health risks and is a physically and psychologically demanding occupation, even more so when the affected woman is pregnant.

Current services provided by health departments include low-threshold, free and, if requested, anonymous counselling on sexually transmitted diseases, on other health-related, medical and social aspects and information on the help that is available. The counselling provided to pregnant women in the context of the Pregnancy Conflicts Act (SchKG) is very important. Payments to pregnant women disbursed in the context of the SchKG depend on an entitlement to benefits under SGB XII, SGB II and III described above and on the entitlement to benefits under the Asylum Seekers' Benefits Act (AsylbLG) or grants received under the Federal Training Assistance Act (BAföG).

The current responsibility of public health departments to provide care to pregnant women who provide sexual services (prostitution) aims to prevent sexually transmitted diseases and provide independent counselling, usually by offering an overview of the specific counselling and support services available in the respective locality. These responsibilities will have to be reorganized once the new Prostitute Protection Act, which was passed by the Bundestag on July 7th, 2016 and does not require the approval of the Bundesrat, comes into force on July 1st, 2017. In addition to the compulsory wearing of condoms, the new Act includes a ban on any advertising which promotes intercourse with pregnant women.

Discussion

It has become clear that little is known about pregnancies which occur in the context of prostitution, even though around 400 000 women work as prostitutes in Germany alone (and the number of unreported women is estimated to be high) [41]. Similarly, concrete data on the incidence of pregnancies and abortions is also lacking.

Inadequate hygienic conditions, violence, a milieu of drugs and alcohol, indebtedness, lack of knowledge about programs of medical and social support or programs helping women to leave prostitution provided by various organizations (public departments, professional information services run by not-for-profit welfare institutions, self-help organizations) place a particularly heavy burden on pregnant women. The resulting risks affect the pregnant woman and the health and development of her child, both in utero and post partum. Because this issue has not been adequately investigated in scientific studies and the literature, the risks cannot be properly quantified or linked to individual

stages of pregnancy. This is the setting in which the present study has attempted to give an approximate assessment. Despite the inherent limitations, this synopsis of the risk factors and environmental conditions commonly found in the context of prostitution which may constitute a threat to the pregnancy shows the high potential risks.

Lack of scientific data

The number of unreported cases is high, and there is a high degree of inter-individual variation, but it is assumed that violence, which can take many forms, is common in the context of prostitution. Studies have suggested that there is an increased risk of pre-term delivery, miscarriage, and pregnancy and obstetric complications when the mother is exposed to violence (sexual, physical and/or psychological violence) during pregnancy. Women working as prostitutes are subject to additional risky conditions. The *cumulative* effect on the pregnancy of the different aspects which have been individually identified as risk factors for mother and child is unknown.

Systematic studies which could be used for evidence-based health promotion are lacking. When the Prostitute Protection Act comes into force, and with it the obligation for prostitutes to be registered, this could lead to more support for relevant healthcare studies which could address the existing scientific lack of information and offer a starting point and an opportunity to collect more data in future.

Deficits in the protection of mother and child

In the workplace pregnant women are protected by occupational medical care and maternity protection laws (MuSchG, MuSch-ArbV). If a pregnant woman falls ill, her general practitioner or gynecologist can certify that she is unable to work. If there are hazards at her place of work which have not yet caused her to fall ill, the Maternity Protection Act means that she may be issued with a ban on carrying out certain types of work, which will depend on the individual circumstances and her level of exposure as certified by a physician. In cases of particular risk (e.g. very high noise levels, smoke, extreme work postures), Article 4 of the Maternity Protection Act additionally stipulates a general ban on working. But both individual and general prohibitions on working issued in the context of the Maternity Protection Act will only result in a *socially and financially secure situation* for expectant mothers if they have contractually regulated terms of employment. Women who are self-employed generally have no such protection against this loss of income. Contrary to the desired effect of protecting mother and child a prohibition on working may represent an *additional risk*, particularly for women in adverse socio-economic circumstances. This may be the reason why in Central Europe the concept of issuing a general prohibition preventing women who are pregnant from working as prostitutes is still very controversial.

This means that measures to improve the situation and provide a secure means of subsistence for expectant women are an indispensable part of promoting a good pregnancy, particularly when the pregnant woman is self-employed.

Currently the regulations on the right to claim welfare benefits because of poverty offer opportunities to improve the situation of

these women. The gynecologist's assessment of an individual situation as so risky that the individual should be banned from working could be supported by the offer of welfare benefits which would provide the pregnant woman with a means of subsistence. The pregnancy counselling services of health departments or not-for-profit welfare institutions have specific information which can make it easier to obtain the appropriate benefits. At the same time these counselling centers can provide individual and anonymous counselling on a number of very different issues which can range from support in maintaining a pregnancy to information on different types of contraception.

In all of these cases, the physician or gynecologist represents an important link. The social security system has the task of creating suitable conditions in which medically indicated measures to combat risk factors can be implemented and treatment, care and support is provided to vulnerable women.

Uniform standard of health protection during pregnancy

Section 5 of the Prostitute Protection Act stipulates that a certificate of registration required to work as a prostitute cannot be issued if the person is under the age of 18 and if the woman is pregnant with just six weeks to delivery when she registers. This is intended as a form of protection. The authorities issuing the certificate are entitled and obliged to ask the women coming to be registered whether they are pregnant. The information given by the women must be true. The reason given for asking these questions is *"the existing unjustifiable risk to the well-being of the as yet unborn child typically associated with working as a prostitute, for example due to the possibility of the increased exposure to specific risks of infection as well as to the specific physical and psychological stresses and unhealthy working hours which commonly accompany the profession"* [1]. The analogous regulations of the Maternity Protection Act are expressly cited with the added pointer that – as most prostitutes do not ply their profession as contractually regulated employees – it is not sufficient to simply refer to the protective terms of the Maternity Protection Act. A separate incorporation of specific protections in the Prostitute Protection Act would be necessary to achieve the requisite and desired protections. But given the fact that there is an interval of 2 years between the requirement to register and the obligation to attend the annual counselling session, the scope of the protection offered remains limited. For individual women exposed to risky situations, the safeguarding provisions covering the six weeks before the birth are likely to be too narrow, as, for example, sexual violence can have a negative impact on the health of mother and child over the entire duration of the pregnancy. The potential protective effects of the Maternity Protection Act go significantly further than the regulations of the Prostitute Protection Act [36]. In particular, they also cover the issue of the financial protection of pregnant women. A revision of the laws on maternity protection will be needed to achieve the goal of a *uniform standard of health protection during pregnancy, postpartum and during the period of breastfeeding* [42].

The urgent challenge for health and social policies will be to create analogous protective regulations which provide a corresponding level of protection and systematic support of mother

and child to those pregnant women for whom the existing maternity protection, which is limited to women with regular employment, does not apply. This would also cover the majority of women working as prostitutes.

The commitment to more far-reaching healthcare policies is justified, not least by the fact that preterm birth is one of the most significant risk factors for neonatal mortality, morbidity and long-term disabilities. In an international comparison of the rates of preterm births in the WHO report on preterm births Germany was only in 106th place out of 193 [43].

Improvement of prenatal care

The provisions of the Maternity Protection Act or of social security systems generally assume that the pregnant woman knows about the available support and the existing regulations and knows how to access support. This is precisely where there are significant deficits, not least because, increasingly, it is adults (or, illegally, adolescents) with an immigrant background who are becoming involved in prostitution, and most have insufficient language skills and little understanding of the German healthcare system. Moreover, affected women additionally anticipate meeting with resentment which can act as an additional barrier to access. In this context, antenatal care offers a special opportunity in the form of target-group-specific low-threshold counselling for problem groups offering access to a confidential space providing protection and support for mother and child and access to the necessary information. The field of gynecology which aims to advancing female health could work together with other health professions or counselling services to integrate such offers of low-threshold access.

If the health benefits of regular antenatal care and protective regulations are to offer a problem group, which in many cases has no legal claims to such care, the same effective protection as the existing legal maternity provisions, policies to support and protect pregnancy and maternity will need to be *incorporated separately*, either in the Prostitute Protection Act itself or in a special expansion of the Maternity Protection Act. At present, health insurance and welfare benefits provide only a limited framework of care which is not available to everyone.

Conclusions

The association between certain factors which constitute risks for pregnancy and which also typically occur in the environment in which sexual services are provided and the increased risk of preterm birth, miscarriage and pregnancy and obstetric complications is well known. But information is lacking, both in Germany and internationally, about the risks for pregnancies and their outcomes which result specifically from prostitution. But this information is necessary to be able to customize health-promoting measures to the actual requirements of mother and child. The onus is on the legislators to provide support to build up our knowledge and create suitable conditions for effective measures – based on the existing regulations of the Maternity Protection Act – which will protect those mothers and children whose needs are only partially addressed by the current legislation and regula-

tions on maternity care and the existing support during pregnancy.

According to the provisions of the Prostitute Protection Act passed in 2016, prostitutes will, in future, be obliged to attend an annual health counseling session provided by the local department of health or other yet to be designated institutions. Counselors should include gynecologists; their services should be directly available to affected women and/or institutions should be able to direct women to gynecologists. While in the case of pregnant women the reason for the visit to a gynecologist and thus the particular vulnerability of these women is clear, in other cases the indications that a pregnant woman is working as a prostitute can otherwise only be deduced following a detailed investigation of the woman's social circumstances and activities [40]. Alcohol and drug abuse, repeated infections or trauma from inflicted violence can offer clues and an entry point for more in-depth confidential communications. In the current environment, the physician, in particular the gynecologist, plays a central role in protecting pregnant prostitutes:

1. through an assessment of the pregnant woman's individual risk,
2. as a counsellor suggesting protective solutions, and
3. as an intermediary providing information on related social security benefits.

This requires gynecologists to know about these solutions and benefits and could be facilitated by a network which would include different social counselling agencies.

Conflict of Interest

The authors declare there are no conflicts of interest.

References

- [1] Bundesministerium für Familie, Senioren, Frauen und Jugend. Gesetzentwurf der Bundesregierung. Entwurf eines Gesetzes zur Regulierung des Prostitutionsgewerbes sowie zum Schutz von in der Prostitution tätigen Personen. Berlin 2016. Online: <http://www.bmfsfj.de/RedaktionBMFSFJ/Abteilung4/Pdf-Anlagen/prostituiertenschutzgesetzentwurf,property=pdf,bereich=bmfsfj,sprache=de,rwb=true.pdf>; last access: 12.07.2016
- [2] Feldblum PJ, Nasution MD, Hoke TH et al. Pregnancy among sex workers participating in a condom intervention trial highlights the need for dual protection. *Contraception* 2007; 76: 105–110
- [3] Duff P, Shoveller J, Zhang R et al. High lifetime pregnancy and low contraceptive usage among sex workers who use drugs- an unmet reproductive health need. *BMC Pregnancy Childbirth* 2011; 11: 61
- [4] Leopold B, Steffan E. Dokumentation zur rechtlichen und sozialen Situation von Prostituierten in der Bundesrepublik Deutschland. Stuttgart: Kohlhammer Verlag; 2001
- [5] Bundesministerium für Familie, Senioren, Frauen und Jugend. Empirische Daten zur Prostitution in Deutschland (Fragen und Antworten zum Bericht der Bundesregierung zu den Auswirkungen des Prostitutionsgesetzes). Online: <http://www.bmfsfj.de/BMFSFJ/root,did=132012.html>; last access: 17.05.2016
- [6] Simoes E, Kunz S, Schmah FW. Inanspruchnahmegradienten in der Schwangerenversorgung fordern zur Weiterentwicklung des Präventionskonzepts auf. *Gesundheitswesen* 2009; 71: 385–390
- [7] Schleußner E. Drohende Frühgeburt. Prävention, Diagnostik und Therapie. *Dt Arztebl* 2013; 110: 227–236
- [8] Catalano R, Serxner S. The effect of ambient threats to employment on low birthweight. *J Health Soc Behav* 1992; 33: 363–377
- [9] Rössler W, Koch U, Lauber C et al. The mental health of female sex workers. *Acta Psychiatr Scand* 2010; 122: 143–152
- [10] Gerdts C, Dobkin L, Green D et al. Side effects, physical health consequences, and mortality associated with abortion and birth after an unwanted pregnancy. *Womens Health Issues* 2016; 26: 55–59
- [11] Heinrichs O. Die Relevanz psychosozialer Faktoren für die Schwangerschaft und die perinatale Periode bei ledigen und geschiedenen Müttern [Inaugural-Dissertation zur Erlangung der medizinischen Doktorwürde]. Medizinischer Fachbereich der Freien Universität Berlin 1977
- [12] Simoes E, Kunz SK, Münnich R et al. Informed Consent bei der Entscheidung zum Kaiserschnitt – methodenbezogene Morbiditätsgradienten erfordern die Befähigung der Schwangeren. *Geburtsh Frauenheilk* 2010; 70: 732–738
- [13] Zhao Y, Chen S. Psychosocial factors for women requesting cesarean section. *Int J Clin Med* 2013; 4: 395–399
- [14] Wurmser H. Einfluss der pränatalen Stressbelastung auf die kindliche Verhaltensregulation im ersten Lebensjahr. In: Brisch KH, Hellbrügge T, Hrsg. *Die Anfänge der Eltern-Kind-Bindung*. Stuttgart: Klett-Cotta; 2007: 129–156
- [15] Spengler D, Binder E, Hrsg. *Epigenetics and Neuroendocrinology: Clinical Focus on Psychiatry*. Band 1. Cham, Switzerland: Springer International Publishing; 2016
- [16] Guardino CM, Schetter CD. Coping during pregnancy: a systematic review and recommendations. *Health Psychol Rev* 2014; 8: 70–94
- [17] Neggers Y, Goldenberg R, Cliver S et al. Effects of domestic violence on preterm birth and low birth weight. *Acta Obstet Gynecol Scand* 2004; 83: 455–460
- [18] Valladares E, Pena R, Ellsberg M et al. Neuroendocrine response to violence during pregnancy – impact on duration of pregnancy and fetal growth. *Acta Obstet Gynecol Scand* 2009; 88: 818–823
- [19] Lee BE, Ha M, Park H et al. Psychosocial work stress during pregnancy and birthweight. *Paediatr Perinat Epidemiol* 2011; 25: 246–254
- [20] Deering KN, Amin A, Shoveller J et al. A systematic review of the correlates of violence against sex workers. *Am J Public Health* 2014; 104: e42–e54
- [21] Shannon K, Kerr T, Strathdee SA et al. Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ* 2009; 339: b2939
- [22] Oppenheimer C. Gewalterfahrungen und Gesundheitssituation bei Prostituierten. *Sozial Extra* 2005; 29: 36–40
- [23] Trost A. Drogenkranke Mütter und ihre Säuglinge: Frühe Beziehungen und ihre Bedeutung für die Prävention psychischer Störungen. In: Franz M, West-Leuer B, Hrsg. *Bindung-Trauma-Prävention – Entwicklungschancen von Kindern und Jugendlichen als Folge ihrer Beziehungserfahrung*. Gießen: Psychosozial; 2008: 219–256
- [24] Robert Koch-Institut. Gesundheitsrisiko Passivrauchen. Online: http://www.rki.de/DE/Content/Gesundheitsmonitoring/Gesundheitsberichterstattung/GBEDownloadsK/2010_3_Gesundheitsrisiko_Passivrauchen.pdf?__blob=publicationFile; last access: 01.08.2016
- [25] Murphy DJ. Epidemiology and environmental factors in preterm labour. *Best Pract Res Clin Obst Gynaecol* 2007; 21: 773–789
- [26] Van Nunen K, Leuridan E, Van Hal G et al. Legal and illegal drug use among female sex workers in bar and club prostitution in Belgium: a quantitative and qualitative study. *Drugs: education, prevention and policy* 2013; DOI: 10.3109/09687637.2013.806432
- [27] Wong WC, Yim YL, Leung TN et al. Prevalence and risk factors of sexually transmitted infections in female sex workers in Hong Kong. *Hong Kong Med J* 2012; 18 (Suppl 3): 42–46

- [28] McDonal HM, Brocklehurst P, Gordon A. Antibiotics for treating bacterial vaginosis in pregnancy. *Cochrane Database Syst Rev* 2007; (1): CD000262
- [29] Flood K, Malone FD. Prevention of preterm birth. *Seminars Fetal Neonat Med* 2012; 17: 58e63
- [30] AWMF. Deutsch-Österreichische Leitlinie zur HIV-Therapie in der Schwangerschaft und bei HIV exponierten Neugeborenen. AWMF-Register-Nr.: 055-002 (S2k-Leitlinie). Bonn 2014. Online: http://www.awmf.org/uploads/tx_szleitlinien/055-002l_S2k_HIV-Therapie_Schwangerschaft_Neugeborenen_2014-verlaengert.pdf; last access: 31.05.2016
- [31] Kavemann B, Rabe H, Hrsg. Das Prostitutionsgesetz. Aktuelle Forschungsergebnisse, Umsetzung und Weiterentwicklung, Opladen: Verlag Barbara Budrich; 2009
- [32] Reinschmidt L. Regulierungsansätze von Prostitution im Europäischen Vergleich. Beobachtungsstelle für gesellschaftspolitische Entwicklungen in Europa 2015. Online: http://www.beobachtungsstelle-gesellschaftspolitik.de/fileadmin/user_upload/Dateien/Veroeffentlichungen/KEX_Regulierung_Prostitution_im_Europaeischen_Vergleich_endg.pdf; last access: 16.05.2016
- [33] Sanders T, Campbell R. Criminalization, protection and rights: global tensions in the governance of commercial sex. *Criminology & Social Justice* 2014; 14: 535–548
- [34] Danna D. Report on prostitution laws in the European Union. 2014. Online: <http://lastradainternational.org/lsidocs/3048-EU-prostitution-laws.pdf>; last access: 16.05.2016
- [35] Kavemann B, Steffan E. Zehn Jahre Prostitutionsgesetz und die Kontroverse um die Umsetzung. *APuZ* 2013; 63: 9–14
- [36] Bundesministerium für Familie, Senioren, Frauen und Jugend. Mutterschutzgesetz. Online: <http://www.bmfsfj.de/BMFSFJ/gesetze,did=3264.html>; last access: 15.07.2016
- [37] Bundesministerium der Justiz und für Verbraucherschutz. Gesetz zum Schutze der erwerbstätigen Mutter. Online: <http://www.gesetze-im-internet.de/muschg/index.html>; last access: 15.07.2016
- [38] Bundesministerium der Justiz und für Verbraucherschutz. Verordnung zum Schutze der Mütter am Arbeitsplatz. Online: <http://www.gesetze-im-internet.de/muscharbv/>; last access: 15.07.2016
- [39] Helfferich C, Fischer C, Kavemann B et al. Untersuchung „Auswirkungen des Prostitutionsgesetzes“ (Sozialwissenschaftliches Frauenforschungsinstitut der Evangelischen Fachhochschule Freiburg). Abschlussbericht. Berlin: Bundesministerium für Familie, Senioren, Frauen und Jugend; 2005: 85 ff. Online: <http://www.bmfsfj.de/doku/Publikationen/prostitutionsgesetz/pdf/gesamt.pdf>; last access: 15.05.2016
- [40] Simoes E, Tropitzsch A, Gharabaghi A et al. Die sozialmedizinischen Aufgaben des Arztes. *Dt Arztebl* 2016; 113: A1426–A1428
- [41] Bundesministerium für Familie, Senioren, Frauen und Jugend. Empirische Daten zur Prostitution in Deutschland (Fragen und Antworten zum Bericht der Bundesregierung zu den Auswirkungen des Prostitutionsgesetzes). Online: <http://www.bmfsfj.de/BMFSFJ/root,did=132012.html>; last access: 17.05.2016
- [42] Bundesministerium für Familie, Senioren, Frauen und Jugend BMFSFJ. Bundeskabinett beschließt Neuregelung des Mutterschutzes. Mitteilung vom 04.05.2016. Online: <http://www.bmfsfj.de/BMFSFJ/familie,did=225260.html?view=renderPrint>; last access: 10.08.2016
- [43] Howson CP, Kinney MV, Lawn JE. Born too soon. The global action report on preterm birth. Geneva: World Health Organization; 2012. Online: http://www.who.int/pmnch/media/newowss/2012/201204_borntoosoon-report.pdf; last access: 24.08.2015
- [44] Henriksen L, Schei B, Vangen S et al. Sexual violence and neonatal outcomes: a Norwegian population-based cohort study. *BMJ Open* 2014; 4: e005935
- [45] Nur N. Association between domestic violence and miscarriage: a population-based cross-sectional study among women of childbearing ages, Sivas, Turkey. *Women Health* 2014; 54: 425–438
- [46] McDougal L, Strathdee SA, Rangel G et al. Adverse pregnancy outcomes and sexual violence among female sex workers who inject drugs on the United States-Mexico border. *Violence Vict* 2013; 28: 496–512
- [47] Stockl H, Filippi V, Watts C et al. Induced abortion, pregnancy loss and intimate partner violence in Tanzania: a population based study. *BMC Pregnancy Childbirth* 2012; 12: 12
- [48] Sanchez SE, Alva AV, Díez Chang G et al. Risk of spontaneous preterm birth in relation to maternal exposure to intimate partner violence during pregnancy in Peru. *Matern Child Health J* 2013; 17: 485–492
- [49] Johri M, Morales RE, Boivin JF et al. Increased risk of miscarriage among women experiencing physical or sexual intimate partner violence during pregnancy in Guatemala City, Guatemala: cross-sectional study. *BMC Pregnancy Childbirth* 2011; 11: 49
- [50] Sarkar NN. The impact of intimate partner violence on women's reproductive health and pregnancy outcome. *J Obstet Gynaecol* 2008; 28: 266–271
- [51] Silverman JG, Gupta J, Decker MR et al. Intimate partner violence and unwanted pregnancy, miscarriage, induced abortion, and stillbirth among a national sample of Bangladeshi women. *BJOG* 2007; 114: 1246–1252
- [52] Kaye DK, Mirembe FM, Bantebya G et al. Domestic violence during pregnancy and risk of low birthweight and maternal complications: a prospective cohort study at Mulago Hospital, Uganda. *Trop Med Int Health* 2006; 11: 1576–1584
- [53] Coker AL, Sanderson M, Dong B. Partner violence during pregnancy and risk of adverse pregnancy outcomes. *Paediatr Perinat Epidemiol* 2004; 18: 260–269
- [54] Satin AJ, Ramin SM, Paicurich J et al. The prevalence of sexual assault: a survey of 2404 puerperal women. *Am J Obstet Gynecol* 1992; 167 (4 Pt 1): 973–975
- [55] Deisher RW, Litchfield C, Hope KR. Birth outcomes of prostituting adolescents. *J Adolesc Health* 1991; 12: 528–533