Original scientific article/Izvirni znanstveni članek

Comparison of reduced hospital stays and readmission rates among antenatal COVID-19-positive patients: A retrospective cohort study

Primerjava krajše ležalne dobe in stopnje ponovnih sprejemov v terciarni bolnišnici pri otročnicah, pozitivnih na covid-19, v antenatalnem obdobju: retrospektivna kohortna raziskava

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Key words: infection; nursing; duration; postpartum; rehabilitation

Ključne besede: okužbe; zdravstvena nega; trajanje; poporodno obdobje; rehabilitacija

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ABSTRACT

Introduction: The COVID-19 pandemic also posed a major risk in the perinatal area. The aim of the study was to investigate the length of hospital stays among COVID-19 positive patients in the early postpartum period compared to the standard duration, and their readmission rates compared to the standard readmission rates in the healthy population.

Methods: The length of stay in hospital after vaginal delivery and caesarean section was examined through a retrospective cohort study. A total of 322 patients were included. The data were obtained from the Hipokrat information system and analysed using descriptive statistics and t-test, with a statistical significance threshold of $p < 0.05$.

Results: On average, the length of stay in hospital after vaginal delivery (*Me* = 2.45) and caesarean section (*Me* = 4.05) was longer than the predetermined duration. The minimum length of stay was approximately three days (*Max* = 3.06) after a vaginal delivery and four days (*Max* = 4.38) after a caesarean section. The results showed no statistically significant differences between the length of stay after vaginal delivery ($p = 0.38$) and after caesarean section ($p = 0.21$) in COVID-19-positive patients.

Discussion and conclusions: It was found that despite the expected shorter length of stay in hospital in COVID-19 positive patients, their treatment was only negligibly longer. Further studies focusing on the early postnatal period are needed.

IZVLEČEK

Uvod: Pandemija virusa covid-19 je predstavljala veliko tveganje tudi na perinatalnem področju. Namen pričujoče raziskave je bil preučiti trajanje bivanja otročnic, pozitivnih na covid-19, po vaginalnem porodu v zgodnjem poporodnem obdobju v primerjavi s standardnim trajanjem in stopnjo njihovih ponovnih sprejemov v primerjavi s standardnimi sprejemi pri zdravi populaciji.

Metode: Uporabljena je bila retrospektivna kohortna raziskava s pregledom trajanja ležalne dobe po vaginalnem porodu in po carskem rezu. Vključenih je bilo 322 otročnic. Podatke, pridobljene iz informacijskega sistema Hipokrat, smo analizirali z opisno statistiko in t-testom ob upoštevani statistični značilnosti $p < 0,05$.

Rezultati: V povprečju je ležalna doba po vaginalnem porodu (*Me* = 2,45) in po carskem rezu (*Me* = 4,05) trajala dlje od zastavljenega trajanja. Maksimalna ležalna doba po vaginalnem porodu je bila približno tri dni (*Maks* = 3,06), po carskem rezu pa štiri dni (*Maks* = 4,38). Rezultati niso pokazali statistično značilnih razlik med ležalno dobo po vaginalnem porodu ($p = 0,38$) in carskem rezu ($p = 0,21$).

Diskusija in zaključek: Ugotovljeno je bilo, da je kljub predvideni krajši ležalni dobi otročnic, pozitivnih na covid-19, njihova obravnava zanemarljivo daljša. Potrebne so nadaljne raziskave v zgodnjem postnatalnem obdobju.

Received/Prejeto: 28. 7. 2023
Accepted/Sprejeto: 10. 11. 2024

https://doi.org/10.14528/snr.2024.58.4.3254

Introduction

The COVID-19 virus pandemic posed significant public health risks, including mental health risks and an increased risk of maternal morbidity and mortality (Elling et al., 2022; Kang et al., 2021; Villar et al., 2021; Semaan et al., 2022). It also had an impact on a significant increase in perinatal anxiety (George et al., 2021; Kang et al., 2021; Vila-Candel et al., 2022). Expectant mothers were concerned about attending hospital check-ups and potential exposure to infections, limited choice of delivery location, the presence of a partner during delivery and breastfeeding support after delivery (Darido et al., 2020; Meaney et al., 2022; Panzer et al., 2022). Ensuring the quality and safety of health care is a priority for all advanced health systems (Ministrstvo za zdravje, Urad Republike Slovenije za nadzor, kakovost in investicije v zdravstvu, 2024). The objectives of measuring the quality of health services are: to provide patients with a choice of high-quality, safe, outcome-oriented and cost-effective health care; to enable healthcare providers to transfer best practices to improve healthcare processes and outcomes (Zavod za zdravstveno zavarovanje Slovene, 2024).

Gomez et al. (2022) found that in the United States, 31% of maternity hospitals encouraged separation of mother and newborn, 37% discouraged breastfeeding in COVID-19 positive mothers, and 59% encouraged shorter length of stay in hospital and earlier discharge. The impact of changing practices related to mother-newborn separation and restrictions on maternity ward visits had an impact on the interest in exclusive breastfeeding in the postpartum period (Alves Mascarenhas et al., 2020; Gonzalez et al., 2021; McClymont et al., 2022). Several measures were taken to reduce the risk of COVID-19 transmission: promotion of early discharge, restrictions or banning of visits, and introduction of digital health education content (Višič, 2022; Wagner et al., 2021; Wood et al., 2022). However, these adjustments could also contribute to a further deterioration of the health outcomes in patients and newborns (Semaan et al., 2022; Višič, 2022). Although standard practices for lactation, breastfeeding support and early discharge preparation were introduced, due to the necessary interventions and newborn screening tests, discharging patients earlier than 24 hours after delivery proved to be unfeasible (Lubbe et al., 2022; Mesarič et al., 2020; Višič, 2022). Therefore, a deeper understanding of the changes and challenges faced by nurses is essential to optimise the quality of nursing care (Gupta et al., 2022; Kang et al., 2021; Kugelman et al., 2021;Višič, 2022).

Aims and objectives

The aim of the study was to determine: a) the length of stay in hospital for positive COVID-19 patients in the early postpartum period compared to the standard duration in non-positive patients, and b) their readmission rates compared to the standard readmission rates in a healthy population. To this end, the following hypotheses were formulated:

H1: On average, the length of stay for COVID-19 positive patients after vaginal delivery is longer than for non-COVID-19 patients.

H2: On average, the length of stay for COVID-19 positive patients after caesarean section is longer than for non-COVID-19 patients.

H3: Reducing the treatment duration results in a higher number of readmission rates compared to standard postnatal readmissions in a healthy population.

Methods

This study employed a quantitative approach, with a retrospective cohort study conducted to obtain data through a review of treatments within an information system.

Description of the research instrument

We conducted a retrospective review of the length of stay in a tertiary hospital among obstetric patients after a vaginal delivery and after a caesarean section, using the Hipokrat hospital information system. After a vaginal delivery, treatment of the patient and the newborn follows the established clinical procedure (if the necessary criteria are met) and is completed after 48 hours, or according to standard treatment, which is completed after 72 hours. After a caesarean section without associated complications, patient treatment is completed after 96 hours. We have designed a treatment diagram to shorten the length of stay for COVID-19 patients with a simpler course of disease. We planned to discharge patients and newborns 36 hours after a vaginal delivery and 48 hours after a caesarean section with health education interventions. The study was divided into two parts. The first part included a retrospective review of the overall course of all infections and the subjects' specific courses of infection, while the second part included a review of the length of stay in hospital up to the year of treatment. At the beginning of the study, we also selectively collected baseline data on the virus pandemic (vaccination status, patient morbidity), but this data collection was later abandoned as the guidelines for monitoring the prevalence of COVID-19 during the pandemic had changed.

Description of the sample

Our sample consisted of Slovenian patients admitted from March 2020 to the end of 2022 who were COVID-19 positive in the antenatal period and gave birth while infected with COVID-19. We included

all patients with vaginal delivery and caesarean section treated on our ward. The sample included patients who were diagnosed with COVID-19 in the late antepartum period shortly before their due date. The inclusion criteria were as follows: patients with a positive RAT (Rapid Antigen Test) smear on admission to the labour ward or isolation unit on the ward, and subsequently a positive PCR (Polymerase chain reaction) control smear confirming COVID-19 infection. The exclusion criterion was a negative RAT control smear on admission. Nurses perform specific nursing and health promotion interventions depending on the mode of delivery and day of treatment (vaginal delivery – day zero: breastfeeding; day one: washing, changing, handling, breastfeeding; day two: discharge with instructions; caesarean section – day zero and day one: breastfeeding; day two: changing, breastfeeding, washing, handling, breastfeeding; day three: breastfeeding, discharge with instructions).

Description of the research process and data analysis

Data on patient demographics, length of stay in hospital, and delivery were obtained by reviewing data in the tertiary hospital information system. Given the research methodology chosen for the study, ethical approval was not required. The review and data collection took place in May 2023. Data analysis was conducted using descriptive statistics. To compare the arithmetic means of two independent samples, we used the t-test for independent samples. The t-test assumes that both samples follow a normal distribution and have equal variances. A p-value < 0.05 was considered statistically significant. The statistical analysis was performed using SPSS (IBM, SPSS Inc., Chicago, IL, USA).

Results

Table 1 shows the outcomes of all deliveries and the proportion of deliveries in COVID-19-positive patients in the period 2020–2022. A total of 322 COVID-19-positive patients were treated in this period. In 2020, a total of 5348 deliveries were performed, with 77 deliveries (53 vaginal deliveries and 24 caesarean sections) in COVID-19-positive patients and 31.16% of these being caesarean sections. In 2021, the total number of deliveries was 5435, with 129 deliveries in COVID-19 positive patients (96 vaginal deliveries and 33 caesarean sections) accounting for almost 2.5% of the increased proportion of treatments, with 25.58% of these deliveries being caesarean sections. With the emergence of the delta variant of COVID-19, followed by a worsening of the disease symptoms,

Table 1: *Proportion of vaginal deliveries and caesarean sections*
Tabela 1: *Delež vaginalnih porodov in carskih rezov*

Year/ Leto	*Mode of delivery/ Vrsta poroda*	*CoV- neg n (%)*	*CoV- pos n (%)*	*Total (%)/ Skupaj (%)*
2020	VagDel	4130 (77.22)	53 (0.99)	4183 (78.21)
	CesSec	1141 (21.33)	24 (0.46)	1165 (21.79)
	Total	5271 (98.55)	77 (1.45)	5348 (100)
2021	VagDel	4167 (76.66)	96 (1.76)	4263 (78.42)
	CesSec	1139 (20.95)	33 (0.63)	1172 (21.58)
	Total	5306 (97.61)	129 (2.39)	5435 (100)
2022	VagDel	3776 (75.96)	82 (1.66)	3858 (77.61)
	CesSec	1079 (21.70)	34 (0.68)	1113 (22.39)
	Total	4855 (97.66)	116 (2.34)	4971 (100)

Legend/Legenda: VagDel – vaginal delivery/vaginalni porod; CesSec – caesarean section/carski rez; n – number/število; % – percentage/ odstotek; CoV- neg – COVID-negative patients/COVID negativne pacientke; CoV- pos – COVID-positive patients/COVID pozitivne pacientke

Table 2: *Statistical presentation of the average length of stay (in days) in COVID-19 positive patients*
Tabela 2: *Statistični prikaz povprečne ležalne dobe (dni) COVID-19 pozitivnih otročnic*

Mode of delivery/ Vrsta poroda	*Min (day)/ Min (dan)*	*Max (day)/ Maks (dan)*	*Me*	$\bar{x}$	*s*	*SE*	*95% CI/ 95% IZ*	*t*	*p*
VagDel	1.71	3.06	2.45	1.50	0.68	0.39	0.75±4.16	7.14	0.38
CesSec	3.78	4.38	4.05	3.20	0.30	0.17	3.29±4.80	8.01	0.21

Legend/Legenda: VagDel – vaginal delivery/vaginalni porod; CesSec – cesarean section/carski rez; Me – mediana/mediana; $\bar{x}$ - average/povprečje; s – standard deviation/standardni odklon; SE – standard error/standardna napaka; Min – minimal value/ minimalna vrednost; Max – maximal value/maksimalna vrednost; CI – confidence interval/interval zaupanja; t – t test/t test; p – level of statistical significance/stopnja statistične značilnosti

extended length of stay was observed. In 2022, there were a total of 4971 deliveries, of which 2.34% were in COVID-19-positive women (n = 116), and 29.31% of caesarean sections. While the microbiology laboratory identified the smears as either positive or negative, the COVID-19 variant was not detected in the follow-up examinations of the patients.

Table 2 presents the results of a statistical analysis of the average length of stay in COVID-19-positive patients after delivery. With the occasional increase in the length of hospitalisation after vaginal delivery and after caesarean section following the emergence of the delta variant of COVID-19 in 2021, the mean length of hospital stay after vaginal delivery was approximately 1.5 days ($\overline{x}$ = 1.5, s = 0.68), suggesting an association with the (un)successful pandemic-related reduction of the length of hospitalisation. The level of statistical significance considered was $p < 0.05$. We did not detect any statistically significant differences between the duration of hospitalisation after vaginal delivery and after caesarean section. Other data are presented in Table 2.

The delta variant of COVID-19 was discovered in 2021. Empirical observation detected moderate to severe disease symptoms and progression in some cases during treatment. The progression of COVID-19 exacerbation may be associated with physical exertion during vaginal delivery and physical activity after a caesarean section under general anaesthesia. With the detection of the COVID-19 virus in the antenatal period and the formulation of a treatment strategy for postnatal patients, a shorter length of stay was achieved in patients with a mild form of the disease. After delivery, the length of stay after a vaginal delivery or caesarean section was approximately equally distributed, according to the treatment doctrine. Table 2 shows a statistical analysis of the mean length of stay in COVID-19-positive patients after delivery compared to the length of stay in non-positive patients. With an increase in the length of stay after vaginal delivery and after caesarean section, the mean length of stay after vaginal delivery was 1.5 days ($\overline{x}$ = 1.5, s = 0.68), suggesting a correlation with the pandemic-related failure to reduce the length of stay in hospital.

Discussion

The aim of our study was to determine the potential association between the length of stay after vaginal delivery and after caesarean section in the early postpartum period. In Slovenia, caesarean section rates have increased significantly in recent years and have stabilised at approximately 21% (Visic et al., 2021), with 31.16% (2020), 25.58% (2021) and 29.31% (2022) in COVID-19-positive patients. Despite an increase in caesarean section rates in each subsequent year of treatment of COVID-19-positive patients and a shortened length of stay, we did not observe any readmissions. The guidelines for early postpartum discharge with appropriate planning and patient choice seem to be a safe and desirable practice, which is evolving into a new modality and standard of care for the future. The set of skills related to newborn care and recovery presented during hospitalisation provide a standard for effective and satisfactory treatment and recovery in the early postnatal period. Handley et al. (2021) found a causal relationship between shortened length of stay in healthy patients and newborns, readmission for jaundice in the newborn, and a decrease in the proportion of exclusive breastfeeding. Barbosa et al. (2022) mention fortnightly hospitalisations in critically ill patients and obesity as the most common causes of disease worsening. Flannery et al. (2022) found no major discrepancies, except in the treatment of symptomatic patients, where all patients with COVID-19 infection received oxygen.

As the results of this study showed no significant difference in the length of stay in the early postpartum period after vaginal delivery and after caesarean section in COVID-19 patients, hypothesis (H1) and hypothesis (H2) were rejected. In most cases, treatment was uneventful, and a mild form of the disease was observed in patients. Mother-newborn cohabitation was ensured throughout the treatment period, breastfeeding was encouraged even in case of COVID-19 infection, and health education counselling was provided. Both hypotheses can be answered by statistical calculations demonstrating prolonged length of stay in 2021 when the delta variant of COVID-19 emerged. However, we did not detect a statistically significant difference in the duration of hospitalisation in women after vaginal delivery ($p > 0.05$). On average, the length of stay after a caesarean section was longer than expected, but not longer than for standard treatment. Empirical observation of the nurses was also important when the length of stay and the associated increase in space constraints made it necessary to find alternative solutions. With the emergence of the delta variant of COVID-19, we also observed a more severe course of the disease, more difficult rehabilitation and poorer independent care of the newborn by the nursing staff. Nevertheless, skin-to-skin contact and breastfeeding were promoted.

Barbosa et al. (2022) report a longer length of stay in cases of a more severe course of illness lasting > 10 days; they also report several shorter hospitalisations < 24 hours, with dyspnoea, fatigue and fever cited as reasons for admission. As the average length of stay after vaginal delivery and caesarean section lasted longer than expected, some patients could not be discharged as planned after 36 hours after vaginal delivery and 48 hours after caesarean section due to medical complications arising from the COVID-19 infection. While their treatment took longer, we did not detect any major complications. Patients actively

participated in their treatment. Despite the measures in place at the time to prevent the spread of infectious diseases (cancellation of visits and partner attendance at delivery), we were able to maintain optimal treatment for both the patients and the newborns.

The third hypothesis (H3) was also rejected. In the studied population, we did not observe any case ($n = 0$) of a COVID-19 positive patient being readmitted after a vaginal delivery or caesarean section in order to shorten the length of stay. In the observed population, no readmissions were noted during the follow-up period, neither due to exacerbation of COVID-19 symptoms nor due to an early postpartum process (ovarian activity, lactation, effective breastfeeding, mastitis, infected surgical site) compared to the standard postnatal readmissions in a healthy population. The success of the treatment, especially for the nurses who contributed to its more efficient implementation, represents an opportunity to develop a modern approach to postnatal care in the future.

Semaan et al. (2022) report on the electronic information and communication technologies to deliver and support health care when its participants are separated by distance. This is a project in which a short hospital stay is provided and further treatment is transferred to the home environment with regular monitoring through various applications. Educational health interventions and the promotion of breastfeeding play an important role in the bonding between the mother and the newborn, as well as in successful adaptation in the early postnatal period (Višić, 2022). Due to the shorter length of hospital stay in COVID-19 positive patients, who were often (especially after the first delivery) exposed to stress and dilemmas about how their further recovery and care for the newborn would proceed at home, most of the involutional processes took place in the home environment.

The study also has some limitations. The population studied included COVID-19-positive patients after vaginal delivery and after caesarean section in the early postnatal period. It would be interesting to investigate how the patients experienced the treatment during isolation. This approach represents a more personalised and effective treatment and will certainly reduce the number of unnecessary interventions in the early postnatal period. The development of a more effective, safer and optimised treatment is the result of a successful collaboration of a multidisciplinary team. The nursing staff adapted the delivery of nursing and educational interventions to reduce patients' length of stay in hospital, while the health education content ensured that no readmissions were recorded during postnatal treatment with COVID-19. Educational interventions on newborn care and breastfeeding help patients recognise their role as more independent and sovereign.

Conclusion

We successfully assessed the needs of COVID-19-positive patients and their newborns in a tertiary hospital. The results of the tailored treatment approach demonstrate a flexible and dynamic treatment method, resulting in a defined clinical pathway and work protocol. The useful information generated by our review of the results can provide a starting point for treatment planning during a pandemic. Recognising the fact that safe treatment leads to effective treatment, even at the expense of shorter hospital stays, a more robust approach to treatment during a pandemic should be developed that involves all health professionals.

Conflict of interest/Nasprotje interesov

The author declares that no conflict of interest exists./Avtor izjavlja, da ni nasprotja interesov.

Funding/Financiranje

The study received no funding./Raziskava ni bila finančno podprta.

Ethical approval/Etika raziskovanja

The tertiary hospital routinely collects data retrospectively to ensure the quality of perinatal care. The survey was conducted in accordance with the principles of the Declaration of Helsinki-Tokyo (World Medical Association, 2013) and the existing Slovenian legal framework (Kodeks etike v zdravstveni negi in oskrbi Slovenije, 2014; Univerza v Ljubljani, 2014)./Terciarna bolnišnica rutinsko retrospektivno zbira podatke za zagotavljanje kakovosti perinatalne oskrbe. Raziskava je bila izvedena z upoštevanjem načel Helsinško-Tokijske deklaracije (World Medical Association, 2013) in obstoječe slovenske pravne podlage (Kodeks etike v zdravstveni negi in oskrbi; Univerza v Ljubljani, 2014).

Literature

Alves Mascarenhas, V. H., Caroci-Becker, A., Pereira Venancio, K. C. M., Girardi Baraldi, N., Caroci Durkin, A., & Gonzalez Riesco, M. L. (2020). Care recommendations for parturient and postpartum women and newborns during the COVID-19 pandemic: A scoping review. *Revista Latino-Americana de Enfermagem*, 28(2), Article e3359. https://doi.org/10.1590/1518-8345.4596.3359 PMid:32785566; PMCid:PMC7417133

Barbosa, R. N., Aparecida Braga, M., Braga Costa, B., & Amedee, F. J. (2022). Treatment of pregnant and early postpartum women with severe and critical COVID-19: Experience at a tertiary center. *European Journal of Medical Research*, 27(26), Article 269. https://doi.org/10.1186/s40001-022-00907-5 PMid:36461042; PMCid:PMC9716514

Darido, J., El Haddad, C., Diari, J., Grevoul Fesquet, J., Bouzid, N., Bobric, A., Lakhdara, N., Bazzi, Z., Lebis, C., Khadam, L., & Rigonnot, L. (2020). COVID-19 in pregnancy: Our experience at a tertiary maternity unit in France. *Clinical Journal of Obstetrics and Gynecology*, 3(2), 54-64.
https://doi.org/10.29328/journal.cjog.1001051

Elling, C., Rider Sleutel, M., Wells, J., Valdez, E., Walker, K., & Nguyen, T. (2022). Women's and nurses' perceptions of visitor restrictions after childbirth during the COVID-19 pandemic. *Clinical Evaluation & Improvement Childbearing*, 26(4), 278-287.
https://doi.org/10.1016%2Fj.nwh.2022.05.002
PMid:35697080; PMCid:PMC9187511

Flannery, D., Zevallos Barboza, A., Pfeifer, M., Hudak, M., Barnette, K., Getzlaff, T., Ellington, S. R., Woodworth, K. R., Dhudasia, M. R., Mukhopadhyay, S., Weinberg, W. W., Foglia, E. E., & Puopolo, K. (2022). Perinatal COVID-19 maternal and neonatal outcomes at two academic birth hospitals. *Journal of Perinatology*, 42(2), 1338-1345.
https://doi.org/10.1038/s41372-022-01446-x
PMid:35778485; PMCid:PMC9247898

George, E., Weiseth, A., & Edmonds, J. (2021). Roles and experiences of registered nurses on labor and delivery units in the United States during the COVID-19 pandemic. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, 50(2), 742-752.
https://doi.org/10.1016/j.jogn.2021.08.096
PMid:34474005; PMCid:PMC8387218

Gomez, J., Wardell, D., Cron, S., & Hurst, N. (2022). Relationship between maternal COVID-19 infection and in-hospital exclusive breastfeeding for term newborns. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 51(5), 517-525.
https://doi.org/10.1016/j.jogn.2022.05.002
PMid:35661652; PMCid:PMC9120128

González-Gil, M.T., González-Blázquez, C., Parro-Moreno, A.I., Pedraz-Marcos, A., Palmar-Santos, A., Otero-García, L., Navarta-Sánchez,M. V., Alcolea-Cosín, M. T., Argüello-López, M. T., Canalejas-Pérez, C., Carrillo-Camacho, M. E., Casillas-Santana, M. L., Díaz-Martínez, M. L., García-González, A., García-Perea, E., Martínez-Marcos, M., Martínez-Martín, M. L., Palazuelos-Puerta, M. P., Sellán-Soto, C., & Oter-Quintana, C., (2021). Nurses' perceptions and demands regarding COVID-19 care delivery in crtical care units and hospital emergency services. *Intensive & Critical Care Nursing*, 62(2), Article 102966.
https://doi.org/10.1016/j.iccn.2020.102966
PMid:33172732; PMCid:PMC7598734

Gupta, V., Yadav, Y., Sharma, R., Mishra, M., Ambedkar, D., & Gupta, V. (2022). Maternal and perinatal outcomes of hospitalized COVID-19 positive pregnant women. *Cureus*, 14(2), 1–6.
https://doi.org/10.7759/cureus.21817
PMid:35261836; PMCid:PMC8894144

Handley, S., Gallagher, K., Breden, A., Lindgren, E., Lo, J., Son, M., Murosko, D., Dysart, K., Lorch, S. A., Greenspan, J., Culhane, J. F., & Burris, H. (2021). Birth hospital length of stay and rehospitalization during COVID-19. *Pediatrics*, 149(1), Article e2021053498.
https://doi.org/10.3389/fsoc.2021.655401
PMid:34889449; PMCid:PMC9645693

Kang, H., Son, Y., Kim, M. J., & Chae, A. M. (2021). Experiences of nurses caring for perinatal women and newborns during the COVID-19 pandemic: A descriptive qualitative study. *Nursing Open*, 8(6), 3358-3365.
https://doi.org/10.1002/nop2.881
PMid:33942555; PMCid:PMC8242804

Kodeks etike v zdravstveni negi in oskrbi Slovenije in Kodeks etike za babice Slovenije. (2014). Zbornica zdravstvene in babiške nege Slovenije – Zveza strokovnih društev medicinskih sester, babic in zdravstvenih tehnikov Slovenije.

Kugelman, N., Toledano Hacohen, M., Karmakar, D., Segev, Y., Shalabna, E., Damti, A., Kedar, R., & Zilberlicht, A. (2021). Consequences of the COVID-19 pandemic on the postpartum course: Lessons learnt from a large-scale comparative study in a teaching hospital. *International Journal of Gynaecology and Obstetrics*, 153(2), 315-321.
https://doi.org/10.1002/ijgo.13633
PMid:33523481; PMCid:PMC9087621

Lubbe, W., Niela-Vilen, H., Thomson, G., & Botha, E. (2022). Impact of the COVID-19 pandemic on breastfeeding support services and women's experiences of breastfeeding: A review. *International Journal of Womens Health*, 14(3), 1447-1457.
https://doi.org/10.2147/IJWH.S342754
PMid:36225180; PMCid:PMC9549794

McClymont, E., Albert, A. Y., Alton, G. D., Boucoiran, I., Castillo, E., Fell, D. B., Kuret, V., Poliquin, V., Reeve, T., Scott, H., Sprague, A. E., Carson, G., Cassell, K., Crane, J., Elwood, C., Joynt, C., Murphy, P., Murphy-Kaulbeck, L., Saunders, S., … for the CANCOVID-Preg Team. (2022). Association of sars-cov-2 infection during pregnancy with maternal and perinatal outcomes. *JAMA*, 327(20), 1983-1991.
http://doi.org./10.1001/jama.2022.5906

Meaney, S., Leitao, S., Olander, E., Pope, J., & Matvienko-Sikar, K. (2022). The impact of COVID-19 on pregnant women's experiences and perceptions of antenatal maternity care, social support and stress-reduction strategies. *Women in Birth*, 35(3), 307-316.
https://doi.org/10.1016/j.wombi.2021.04.013
PMid:33994134; PMCid:PMC9051126

Ministrstvo za zdravje, Urad Republike Slovenije za nadzor, kakovost in investicije v zdravstvu. (2024). *Kakovost zdravstvenega varstva*.
https://www.gov.si/teme/kakovost-zdravstvenega-varstva/

Panzer, A., Reed-Weston, A., Friedman, A., Goffman, D. & Wen, T. (2022). Expedited postpartum discharge during the COVID-19 pandemic and acute postpartum care utilization. *The Journal of Maternal-Fetal & Neonatal Medicine*, 35(25), 9585-9592. https://doi.org/10.1080/14767058.2022.2048815 PMid:35282750

Semaan, A., Dey, T., Kikula, A., Asefa, A., Delvaux, T., Langlois, E., van den Akker, T., & Benova, L. (2022). "Separated during the first hours"- postnatal care for women and newborns during the COVID-19 pandemic: A mixed-methods cross-sectional study from a global online survey of maternal and newborn healthcare providers. *PLOS Global Public Health*, 2(4), Article e0000214. https://doi.org/10.1371/journal.pgph.0000214 PMid:36962168; PMCid:PMC10022345

Vila-Candel, R., Gonzalez Chorda, V., Soriano-Vidal, F. J., Castro-Sanchez, E., Rodriguez-Blanco, N., Gomez-Segui, A., Andreu-Pejó, L., Martínez-Porcar, C., Rodríguez Gonzálvez, C., Torrent-Ramos, P., & Mena-Tudela, D. (2022). Obstetric-neonatal care during birth and postpartum in symptomatic and asymptomatic women infected with SARS-CoV-2: A retrospective multicenter study. *International Journal of Environmental Research and Public Health*, 19(9), Article 5482. https://doi.org/10.3390/ijerph19095482 PMid:35564880; PMCid:PMC9103978

Villar, J., Ariff, S., Gunier, R., Thiruvengadam, R., Rauch, S., & Kholin, A. (2021). Maternal and neonatal morbidity and mortality among pregnant women with and without COVID-19 infection. *JAMA Pediatrics*, 175(8), 817-826. http://doi.org/10.1001/jamapediatrics.2021.1050 PMid:33885740; PMCid:PMC8063132

Visic, U., Stopar Pintaric, T., Albreht, T., Blajic, I., & Lucovnik, M. (2021). Multimodal stepwise analgesia for reducing opioid consumtion after cesarean delivery. *Clinical and Experimental Obstetrics & Gynecology*, 48(5), 1162-1166. https://doi.org/10.31083/j.ceog4805186

Višič, U. (2022). Digitalizacija zdravstveno-vzgojnih vsebin šole za starše v času pandemije COVID-19. In T. Marčun & E. Dornik (Eds.), *Odločno digitalno za več zdravja: Kongres MI'2022: zbornik prispevkov in povzetkov, Ljubljana, November 2022* (pp. 79–80). Slovensko društvo za medicinsko informatiko.

Wagner, M., Falcone, V., Neururer, S., Leitner, H., Delmarko, I., Kiss, H., Berger, A., & Farr, A. (2021). Perinatal and postpartum care during the COVID-19 pandemic: A nationwide cohort study. *Birth Issues in Perinatal Care*, 49(2), 243-252. https://doi.org/10.1111/birt.12594 PMid:34617310; PMCid:PMC8653168

Wood, K., Schmitz, A., & Bhoojhawon, G. (2022). Early discharge from a Newborn Nursery in the United States during the COVID-19 pandemic. *COVID*, 2(3), 379-388. https://doi.org/10.3390/COVID2030026

World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *Journal of the American Medical Association*, 310(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053 PMid:24141714

Zavod za zdravstveno zavarovanje Slovenije. (2024). *Kazalniki kakovosti*. https://partner.zzzs.si/zdravstvene-storitve/kazalniki-kakovosti/

Cite as/Citirajte kot:
Višić, U. (2024). Comparison of reduced hospital stays and readmission rates among antenatal COVID-19-positive patients: A retrospective cohort study. Obzornik zdravstvene nege, 58(4), 245–251. https://doi.org/10.14528/snr.2024.58.4.3254