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# Effectiveness of Doula Care during Intra - Natal Period on Selected Outcome Variables among Labouring Mothers

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**Abstract:** ***Introduction: labour is one of the most exciting, joyous and important events of woman's life, but often accompanied by fear of labour pain and birth outcomes. A birth companion, accompany the labouring mothers for a successful labour and birthing process. Objective: To assess the effectiveness of doula care on labouring mothers during intra-natal period admitted in CLR, Nehru Hospital, PGIMER, Chandigarh. Method: A quasi-experimental design was used and 120 sample from CLR, Nehru hospital, PGIMER, Chandigarh was selected by using purposive sampling technique from July to September 2019. The tools used for data collection are socio-demographic and obstetrical profile, state and trait anxiety inventory, numeric pain scale, partograph and birth satisfaction scale. Level of anxiety is assessed in the experimental group after implementing the doula care (psychological support by doula as a birth companion, effleurage massage, breathing exercises, and positioning) and in the control group after giving routine care. First assessment of labour pain was done at 3-4cm dilatation of cervix, second assessment done after 2 hours of first observation and so on in both the groups. Duration of active phase of labour, mode of delivery and use of pain relief medications was assessed by partograph from 4cm to full dilatation. Birth satisfaction was assessed in both the groups after delivery. Results: The study findings revealed that, doula care is effective in reduction of anxiety and pain during labour, decreases the incidence of caesarean, reduces prolonged labour, lessen the use of pain relief medications and increases the birth satisfaction level as shown by Mann-Whitney test, independent t-test and Wilcoxon test ($p<0.05$). Conclusion: The study findings concluded that, the doula care helps the women to have a safe, memorable and empowering birth experience.***

**Keywords:** Doula, Doula care, Psychological support, Effleurage massage

## 1. Introduction

Motherhood is a state or experience of having or raising a child. It gives a new sense of purpose and meaning in women's life. It is a combination of raw emotions, experiences, hope and dreams for the children. It is one of the most sacred journey, the women travel in her life. Pregnancy is a beautiful phase, because it gives a woman the joy and fulfilment which comes from bringing a new life into the world. Childbirth can be a time of excitement and anxiety and many women and their partners are nervous when labour approaches. The moment a child is born, the mother is also born. She never existed before. The woman existed, but the mother, never. The experience of giving birth has long term implications for a woman's health and wellbeing. The birth experience and satisfaction with birth have been associated with several factors and emotional dimensions of care and been shown to influence women's overall assessment.

Labour and delivery process are an exciting, anxiety-provoking, out rewarding time for the woman and her family. This is the time where mothers except more care from nurses and midwives. A subsequent study identified some of the barriers to supportive care cited by nurses as inadequate staffing, the physical environment, negative staff attitude toward supportive care and lack of management support. This gap in care clearly provides a place in which doulas can assist in providing optimal intrapartum care. A Doula also known as a Birth Companion, birth coach or post-birth supporter, is a non-medical person who assists a woman before, during, or after child-birth, to provide emotional support and physical help if needed. The support provided by doula during childbirth include physical assistance (massage, maintaining a supporting posture or providing water) and comfort, emotional support (providing company, encouragement or simply talking in a soothing tone of voice) and acting as an advocate for the woman undergoing childbirth (suggesting options or supporting the woman's decisions to a medical team). "Doulaing is the act of educating, loving, respecting, listening, embracing, advocating for and assisting a woman prenatally, during labour, childbirth and after".

**Objectives**

1) To develop a doula care module for labouring mothers in CLR, Nehru Hospital, PGIMER, Chandigarh.
2) To assess the effectiveness of doula care on labouring mothers in CLR, Nehru Hospital, PGIMER, Chandigarh.

**Selected Outcome Variable**

It refers to the measurement of the outcome in term of duration of labour, progress of labour, use of pain relief medications, anxiety level, satisfaction level and birth outcomes. (Normal vaginal delivery, Caesarean section, Instrumental delivery).

## 2. Material and Methods

**Research approach:** Quantitative research approach
**Research design:** Quasi-experimental design
**Research setting:** The research was conducted in Clean Labour Room, Nehru Hospital, PGIMER, Chandigarh.
**Accessible population:** Labouring mothers (primigravida and multigravida) 37 to 42 weeks of gestation who were admitted in the CLR, Nehru Hospital, PGIMER, Chandigarh (July-August 2019)

**Method of sampling:** The samples had been selected by purposive sampling technique and then divided into two parts-experimental and control group.

**Sample size:** The sample size was 120 (60 in each group)

**Methods of Data Collection**
Prior permission was obtained from the department of Obstetrics and Gynaecology, PGIMER, Chandigarh and on duty doctors were also informed. Investigator introduced herself to the labouring mothers and the objectives of the study were explained and written informed consent was taken from the labouring mothers. This was divided into four phases.

**Phase 1: Identification of the mothers**
By using socio-economic and Obstetrical profile proforma, labouring mothers with gestational age of 37 to 42 weeks was identified during their admission at CLR. They were interviewed and their socio-demographic proforma was filled.

**Phase II: Orientation and explanation**
The samples was divided in two parts-experimental and control group.

**In experimental group:** The investigator introduced herself to the labouring mothers and explained them about doula and then gradually moved to the interview by asking questions. Then the investigator oriented them to the ward routine and explained about the labour process by using a flash book.

**In control group:**
The investigator introduced herself to the labouring mothers and gradually move to the interview by asking questions. Routine care was provided to them.

**Phase III: Demonstration**

**Experimental group:** After orientation, demonstrating the labouring mothers about breathing techniques, massage therapy and explaining them about the labour process.

**Control group:** Routine care was provided to them. Medical interventions are given by the staff.

**Phase IV: Implementation**
After the demonstrations given by the doula, mother performed each step during first stage of labour, when contraction begins and continues until the contractions stop. It follows as following sequence:

- Slow breathing exercises
- Effleurage massage on abdomen
- Positioning

After the contraction stop, the mother had taken a deep breath. The steps were again performed by the mother with the help of doula when the next contraction begins.

**Phase V: Evaluation** – In this phase, follow ups by investigator were done to assess the effectiveness of doula care.
The investigator assessed the following parameters:

**Anxiety**-It was assessed using the STAI scale (State Trait Anxiety Inventory) after orientation of ward set-up, health personnel and explaining labour process in experimental group and in control group anxiety assessed after admission in CLR. The trait anxiety questionnaire and state anxiety questionnaire (before intervention) was assessed in both the groups after admission in CLR, Nehru Hospital, PGIMER, Chandigarh. The state anxiety questionnaire was assessed after implementation of doula care (after 4 hours) in experimental group and routine care in control group.

**Pain:** It was assessed using the Numeric pain scale every 2 hours during active phase of first stage of labour. Maximum of 3 observations was done in each group (experimental and control group). 1st observation of labour pain was assessed at 3-5cm of dilatation, 2nd observation done after 2hours of 1st observation, 3rd observation is done after the 2hours of 2nd observation and total five observations were made.

| Pain intensity | Observation 1 (during 4-5cm dilatation of the cervix) | Observation 2 (after 2 hrs interval of 1st observation) | Observation 3 (after 2 hrs interval of 2nd observation) | Observation 4 (after 2 hrs interval of 3rd observation) | Observation 5 (after 2 hrs interval of 4th observation) |
|---|---|---|---|---|---|
| | | | | | |

**Duration of first stage of labour and use of analgesics:** It was noted using the WHO partograph. (control and experimental group)

**Birth satisfaction level:** It was assessed by using the birth satisfaction scale.

## 3. Results

**Socio-demographic profile of the labouring mothers:**
The socio-demographic profile of the 120 labouring mothers is depicted in **table 1** below.

The majority of women's in both the groups are between 18-35 age group (mean $27.11 \pm 4.17 SD$ range 18-38yrs). Majority (73%) of the labouring mothers in both groups belonged to Hindu religion. As per educational status 83.3% in control group were intermediate educated and more than 20% were educated up to high standard. 36.6% in experimental group were educated up to metric. The majority of the labouring mothers in both the groups 68.7% in control group and 55% in experimental group belong to joint family. 80% of the labouring mothers in both the groups were housewives. The majority of the mothers in both the groups had 3600-5000 monthly per capita income. About 80% of the labouring mothers were vegetarian in both

the groups. The socio-demographic variables of both the groups were homogenous (p value >0.05).

**Table 1:** Socio-demographic profile of labouring mothers, N=120

| Variables | Control group (N=60) | Experimental group (N=60) | $\chi^2$ (df) P value |
|---|---|---|---|
| **Age (in years)** | | | |
| • <18 years | 25 (41.7%) | 36 (60.0%) | 0.416 |
| • 18-35 years | 33 (55.0%) | 21 (35.0%) | (2) |
| • >35 years | 2 (3.3%) | 3 (5.0%) | 0.102 |
| **Religion** | | | |
| • Hindu | 44 (73.3%) | 44 (73.3%) | 1.391 |
| • Muslim | 3 (5.0%) | 6 (10.0%) | (2) |
| • Sikh | 13 (21.7%) | 10 (16.7%) | 0.552 |
| **Education** | | | |
| • Illiterate | 4 (6.7%) | 6 (10.0%) | 2.327 |
| • Metric | 28 (46.7%) | 22 (36.7%) | (4) |
| • Intermediate | 5 (83.3%) | 3 (5.0%) | 0.705 |
| • Graduate | 17 (28.3%) | 21(35.0%) | |
| • Post-graduate | 6 (10.0%) | 8 (13.3%) | |
| **Type of family** | | | |
| • Nuclear | 17 (28.3%) | 21 (35.0%) | 3.286 |
| • Joint | 41 (68.7%) | 33 (55.0%) | (2) |
| • Extended | 2 (3.5%) | 6 (10.6%) | 0.199 |
| **Occupation:** | | | |
| • Home-maker | 51 (85.0%) | 48 (80.0%) | 1.377 |
| • Farmer | 4 (6.7%) | 3 (5.0%) | (2) |
| • Professional | 5 (8.3%) | 9 (15.0%) | 0.587 |
| **Per capita income** | | | |
| • 500-1500 | 10(71.4%) | 4(28.6%) | |
| • 1600-3500 | 19(71.4%) | 8(29.6%) | 11.92 |
| • 3600-5000 | 8(33.3%) | 16(66.7%) | (3) |
| • >5000 | 23(41.8%) | 32(58.2%) | 0.110 |
| **Type of work** | | | |
| • Sedentary | 1 (1.7%) | 1 (1.7%) | 1.083 |
| • Moderate | 53 (83.6%) | 56 (93.3%) | (2) |
| • Strenuous | 6 (10.0%) | 3 (5.0%) | 0.743% |
| **Dietary pattern** | | | |
| • Vegetarian | 48 (80.0%) | 48 (80.0%) | 0.000 |
| • Non-vegetarian | 12 (20.0%) | 12 (20.0%) | (1) |
| | | | 1.000 |

**Obstetrical profile of the labouring mothers: Table 2**shows that, more than80% of labouring mothers were attained their menarche at the age of 12-15yrs and had gestational age of 37-40weeks in both the groups. One fourth of the labouring mothers in both the groups were married in the last 2-5 years. Equal no. i.e. 50% of the labouring mothers were multigravida and primigravida in both the groups 65% of the labouring mothers in both the groups weighted 50-70kg and had no history of abortion.

**Table 2:** Obstetrical Profile of the labouring mothers, N=120

| Clinical variables | Experimental group (N=60) | Control group (N=60) | $\chi^2$ (df) p value |
|---|---|---|---|
| **Attainment of menarche** | | | |
| • <12 years | 5 (8.3%) | 1 (1.7%) | 3.081 |
| • 12-15 years | **54 (90.0%)** | **57 (90.0%)** | (2) |
| • >15 years | 1 (1.7%) | 2 (3.3%) | 0.322 |
| **Duration of marriage** | | | |
| • <2 years | **26 (43.3%)** | **25 (41.7%)** | 0.737 |
| • 2-5 years | 16 (26.7%) | 20 (33.3%) | (2) |
| • >5 years | 18 (30.0%) | 15 (25.0%) | 0.692 |
| **Gravida** | | | |
| • Primigravida | 30 (50%) | 30 (50%) | |
| • Multigravida | 30 (50%) | 30 (50%) | |
| **Gestational weeks** | | | |
| • <37 weeks | 3 (5.0%) | 11 (18.3%) | 7.814 |
| • 37-40 weeks | **54 (90.0%)** | **49 (81.7%)** | (2) |
| • >40 weeks | 3 (5.0%) | 0 (0.0%) | 0.017 |
| **Weight of mother** | | | |
| • <50kg | 10 (16.7%) | 13 (21.7%) | 0.903 |
| • 50-70kg | **45 (75.0%)** | **44 (73.3%)** | (2) |
| • >70kg | 5 (8.3%) | 3 (5.0%) | 0.657 |
| **History of abortion** | | | |
| No | **43 (71.7%)** | **40 (66.7%)** | 0.355 |
| Yes | 17 (28.3%) | 20 (33.3%) | (1) |
| | | | 0.693 |

**Comparison of scores of state anxiety level among labouring mothers**

**Table 3** shows the comparison of state anxiety level among labouring mothers. There was a statistically significant difference between experimental and control group in relation to anxiety level as shown by Mann-Whitney test. ($p<0.05$). There was also a statistically significant difference between both the groups before and after interventions in experimental group and routine care in control group as shown by the Wilcoxon test ($p<0.05$).

Hence, it shows that doula care protocol is effective in reducing the level of anxiety in labouring mothers. The null hypothesis is rejected

**Table 3:** Comparison of scores of anxiety level among labouring mothers, N=120

| | State anxiety (Before interventions) | | State anxiety (After interventions) | |
|---|---|---|---|---|
| | Experimental group (n=60) | Control group (n=60) | Experimental group (n=60) | Control group (n=60) |
| Median | 1 | 2 | 2 | 2 |
| IQR | 1-2 | 1-2 | 1-2 | 1-2 |
| U-test (df) p-value | 1764.500 (2) 0.817 | | 1137.00 (2) 0.000 | |
| Wilcoxon test | -4.605 (0.000) | | | |

**Comparison of scores for intensity of labour pain among labouring mothers**

**Table 4** shows that there was statistically significant relation between pain level among both the groups as shown by Mann-Whitney test ($p<0.05$). it was inferred that the doula care protocol is effective in reducing the level of pain among labouring mothers.

**Table 4:** Comparison of scores forintensity of labour pain among labouring mothers, N=120

| Pain intensity Score | 1st observation during 3-4cm dilatation of the cervix (O1) | | 2ND observation after 2 hours interval of 1st observation (O2) | | 3rd observation after 2 hours interval of 2nd observation. (O3) | |
|---|---|---|---|---|---|---|
| | Experimental group (n=60) | Control group (n=60) | Experimental group (n=60) | Control group (n=60) | Experimental group (n=60) | Control group (n=60) |
| Median | 3 | 3 | 2 | 2 | 2 | 3 |
| IQR | (1-3) | (1-3) | (2-3) | (2-3) | (2-3) | (2-3) |
| Mann-Whitney value<br>p-value | 1746.50<br>0.753 | | 1590.00<br>0.195 | | 1290.00<br>0.002 | |

**Comparison of duration of active phase of labour among labouring mothers**

**Table 5** depicts the comparison of duration of active phase of first stage of labour between both the groups in hours. Mean of the experimental group is 5.3667 and 7.300 of the control group. Mean difference of both the group was -1.9333. The independent T-test was used which showed a significant difference between both the groups in relation to duration of labour ($p<0.001$).

**Table 5:** Comparison of duration of active phase of labour among labouring mothers, N=120

| Duration of labour | Experimental group (n=60) | Control group (n=60) |
|---|---|---|
| Mean | 5.3667 | 7.300 |
| SD | 0.974 | 0.126 |
| Mean difference | -1.9333 | |
| t-test<br>(df)<br>p-value | -7.643<br>(118)<br>0.000 | |

95% CI mean ± SD: 6.333±1.689

**Mode of delivery among labouring mothers**

Figure 1 depicts the mode of delivery among labouring mothers in experimental and control group. Majority (86.70%) of the labouring mothers in the experimental group underwent normal vaginal delivery and only 5% labouring mothers underwent emergency LSCS.

Whereas, in control group 60% of the labouring mothers undergo normal vaginal delivery and 13% of the labouring mothers underwent emergency LSCS.

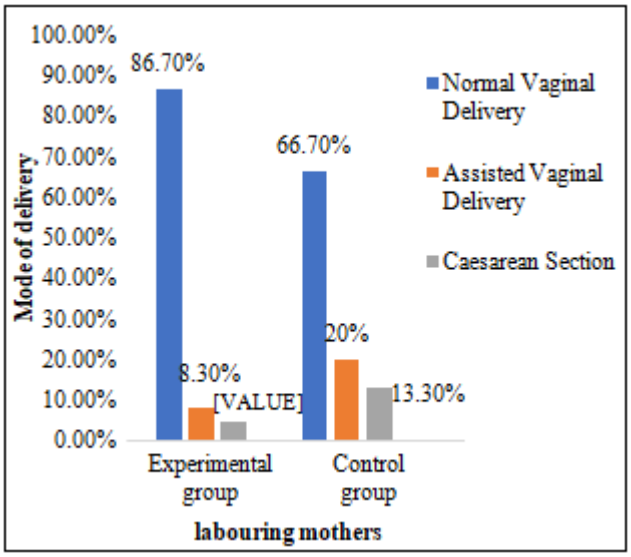


**Figure 1:** Mode of delivery among labouring mothers

**Use of analgesics among labouring mothers**

**Figure 2** depicts the use of analgesics during the labour among the labouring mothers in the experimental and control group. About 55% of the labouring mothers in the control group received analgesics during labour whereas, only 33% of the labouring mothers in the experimental group received analgesics. Most of the labouring mothers in both the groups not received any analgesics during labour.

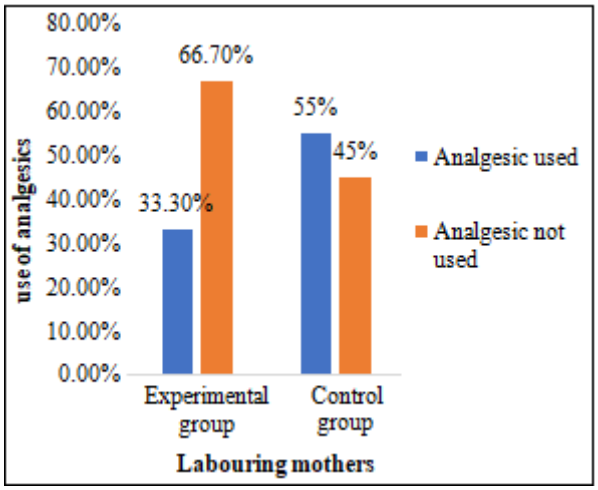


**Figure 2:** Use of analgesics among labouring mothers

**Comparison of birth satisfaction among labouring mothers**

**Table 6** shows that, most of the labouring mother (65%) in the experimental group were satisfied with the birthing experience, 28.3% were highly satisfied. Only 6.7% of the labouring mothers were not satisfied. Whereas, in the control group, 55% of the labouring mothers were satisfied, 31.7% were not satisfied and only 13.3% were highly satisfied. There was a statistically significant difference in experimental and control group in relation to birth satisfaction level as shown by Mann-Whitney test ($p<0.05$). Hence, this shows that doula care protocol is effective in increasing the birth satisfaction level among labouring mothers.

**Table 6:** Comparison of birth satisfaction among labouring mothers, N=120

| Birth satisfaction score | Experimental group (n=60) | Control group (n=60) |
|---|---|---|
| Not satisfied (24-34) | 4 (6.7%) | 19 (31.7%) |
| Satisfied (35-45) | 39 (65%) | 33 (55.0%) |
| Highly satisfied (46-58) | 17 (28.3%) | 8 (13.3%) |
| $\chi^2$ (df)<br>p-value | 13.52 (2)<br>0.001 | |
| Median<br>(IQR) | 2<br>(1-3) | 2<br>(1-3) |
| Mann-Whitney value<br>(p-value) | 1225.00<br>0.001 | |

**Doula satisfaction level among labouring mothers in the experimental group**

**Figure 3** depicts the Doula satisfaction level among labouring mothers in the experimental group

The doula care is given to the experimental group only (n=60). Majority (62%) of the labouring mothers were strongly agreed that there is a need of having a birth companion with them during labour and are agreed that doula is competent and paid attention to their health care needs and provide psychological support to them during labour. Only 10% of the labouring mothers shows neutral response towards the care given by the doula whereas no one was dissatisfied with the care given by doula. None of the labouring mothers selected, strongly disagree and disagree option in the doula satisfaction scale.

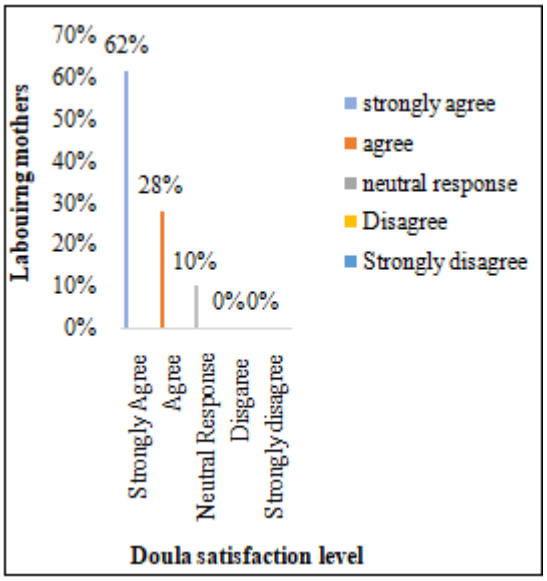


**Figure 3:** Doula satisfaction level among labouring mothers in the experimental group

## 4. Discussion

A birth companion, accompany the labouring mothers by providing touch therapy, massage, giving positions and teaching breathing techniques, is important for a successful labour and birthing process.

Findings of the present study proved that there was a statistically significant difference between both the groups in relation to anxiety level as shown by the Mann-Whitney test (p-value<0.05). It can be concluded that doula care protocol is effective in reducing the state anxiety among the labouring mothers. Findings of the study was supported by the study done by Marzeich Akbar Zadeh, on comparing the doula supportive care and providing acupressure on reducing mother's anxiety level. Result of the study conclude that doula supportive care and acupressure reduces the anxiety level. The significant difference was observed among the groups regarding the mother's anxiety level (p<0.001).

The present study findings revealed that pain intensity is increased as the labour progresses but the experimental group reported less pain as compare to control group. In the present study doula care module includes the positioning (upright, sitting and standing position) during the labour to reduce the pain level. Findings of the study conducted by Rubneide et.al (2013), on the effect of massage during labour on reduction of labour pain also shows the same results.

Findings of the present study showed that there was a significant difference between duration of labour (active phase of labour) in experimental and control group as shown by independent t-test. (p<0.001). Therefore, it is inferred that doula care module is effective in reducing the incidence of prolonged labour. Findings of the present study were also supported by study conducted by Nahid Bolbol-Haghighi (2016), on Effect of Massage Therapy on Duration of Labour. The findings of this study showed the same results.

Findings of the present study revealed that there was statistically significant difference between mode of delivery of experimental and control group as shown by U-test (p<0.05). It is a foremost important finding to note that doula care module is effective in reducing the caesarean sections. The present study was supported by the study done by Katy backs Kozhimannil (2013), that caesarean rate was 22.3% among doula-supported births and 31.5% among medical beneficiaries. Caesarean sections were 40.9% lower for doula supported births.

The present study findings revealed that, about 55% of the labouring mothers in the control group received analgesics during labour. Whereas, only 33% of the labouring mothers in the experimental group received the analgesics. The doula care is also effective in reducing the use of analgesics during labour. A similar study done by Sauls, 2002, reported that continuous labour support had lowered the rates of analgesics and anaesthesia use, lowered operative birth rates, shortened the labour and increased the maternal satisfaction.

The present study findings revealed that, there was statistically significant difference in experimental and control group on birth satisfaction level as shown by Mann-Whitney test (p<0.05). As the WHO guidelines also recognized the presence of birth companion during labour for a positive childbirth experience. The present study was supported by the studies conducted by Cherly Michelle (2015) and Abushaikha I, Oweis (2005) which shows the same results, that the doula helped to have positive birth experience.

## 5. Conclusion

Supportive care during labour may enhance physiological labour processes, as well as women's feelings of control and confidence in their own strength and ability to give birth. So, the Doula care is found effective in reduction of anxiety level, lowering the intensity of pain, minimizing the risk of prolonged labour, lowering the Caesarean section rate, lessen the use of analgesics during labour and increasing the birth satisfaction level among labouring mothers.

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