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Effect of Educational Intervention Programme on Health Seeking Behaviour Regarding Neonatal Jaundice among Pregnant Mothers in Selected Antenatal Clinics in Ilorin, Kwara State

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Abstract

Neonatal jaundice (NNJ) is a cause of neonatal morbidity and mortality. Previous intervention studies on NNJ focused on increasing the knowledge of mothers and not improving the health-seeking behaviour of the mothers. Therefore, this study evaluated the effect of educational intervention on health-seeking behaviour regarding NNJ among pregnant mothers in selected antenatal clinics in Ilorin, Kwara State, Nigeria. Quasi-experimental research design was employed for this study. Eight Primary Health Centres (PHC) with the highest patronage formed the study population of 1368 pregnant women. A sample of 128 was determined using the power formula and systematic sampling technique was used to select 16 participants from each PHC. Data were collected using questionnaire at baseline, immediate post-intervention, and 8th week follow-up. Findings showed that there was significant difference ($p < 0.05$) in the mean score of health-seeking behaviour of NNJ between baseline for the Intervention Group (IG) (8.28 ± 2.11) and 8th week follow-up (10.82 ± 1.28), but there was no significant difference ($p > 0.05$) in the health-seeking behaviour of NNJ for the Control Group (CG) between baseline (7.80 ± 2.07), and 8th week follow-up (7.80 ± 2.07). IG had an Effect Size (ES) of -1.47 (-1.77 to -1.17) for the health seeking behaviour. The study concluded that educational intervention improved the health-seeking behaviour of pregnant women attending antenatal clinic in Ilorin, Kwara State, Nigeria. This study recommended that primary health centres should implement a routine health educational program towards improving the health-seeking behaviour of pregnant women regarding neonatal jaundice.

Keywords: Antenatal clinic, Educational intervention, Health-seeking Behaviour, Neonatal jaundice, Pregnant women

Introduction

The neonatal period is crucial to the survival of any newborn. Being healthy and staying at it depends extensively in terms of how problems that can complicate the neonatal period are managed. There are various health problems that may affect the neonatal period such as neonatal sepsis, asphyxia, pneumonia but neonatal jaundice is one of the deadliest conditions that progress to severe complications and eventually death (GBD, 2019).

Neonatal jaundice is a condition that affects one in two infants globally due to excessive level of accumulated bilirubin in the blood (hyperbilirubinemia) which could be due to physiological or

pathological processes and is characterized by a yellowish discoloration of the skin, sclera, mucous membranes and nails (Ansong-Assoku et al., 2023).

Neonatal jaundice (NNJ) is a major cause of preventable childhood mortality and long-term impairment especially in countries with significant prevalence of the inherited condition, glucose-6-phosphate dehydrogenase (G6PD) defect. Every year approximately 10.8 million children under the age of five years die worldwide and 38% of these mortalities are reported to occur in the first month of life (WHO, 2022). Global estimates suggest that approximately 3.6 million deaths occur in the neonatal period. Donkor et al. (2023) reported that Neonatal jaundice is an important cause of neonatal morbidity worldwide and represents about 60% and 80% of full-term and preterm neonates respectively, Aside from being a known cause of neonatal mortality, acute bilirubin encephalopathy (ABE) results in chronic handicapping conditions such as cerebral palsy, deafness, speech disorders, learning disabilities and mental retardation (Dalwai et al, 2021).

It was reported that severe neonatal jaundice with ABE contributed to about 50% of all cases of cerebral palsy (Kumar et al, 2021). Neonatal Jaundice is a known reason for hospital admission and re-admission in neonatal period (Ogunlesi et al., 2015). Jaundice happens when your baby's blood has too much bilirubin. Severe jaundice can occur if a baby has a blood infection, a different blood type than the mother, bruising from a difficult birth, too many red blood cells, and a low oxygen level (hypoxia).

Newborn Jaundice is divided into two groups: physiologic jaundice and pathologic jaundice. Physiological jaundice in newborns is caused as a result of increased bilirubin production, increased red blood cell mass and short-lived red blood cells, physiologic jaundice begins in the second or third day of life and its peak occurs about the fourth or fifth day of life (Vij & Rela, 2020). Physiological jaundice is very common and usually harmless and is not associated with any disease (Seid et al., 2019) in most infants; NNJ is physiological and resolves spontaneously by the end of the first week (term) or second week (preterm) after birth. Nevertheless, a significant number of infants have an associated pathological cause of jaundice and will need treatment, mostly with phototherapy or exchange blood transfusion for severely affected infants (Seneadza et al., 2022).

Unfortunately, on some occasions when NNJ is noticed early by the mother or close relatives, ineffective medications and treatment options are offered the mothers sometimes by friends, other relatives, concerned neighbors and sometimes by "healthcare workers" or they may even be advised to ignore medical counsels (Khalaf et al., 2019). Previous studies on NNJ in Nigeria reported a poor health seeking behavior among pregnant women (Donkor et al., 2023). For instance, about 80% of participants in a study conducted in Lagos (an urban center city in Nigeria) preferred to take their jaundiced infant home and only 9.5% of them noted the intention to make use of exposure to UV light (the sun) as a treatment option. Also, only 56.6% of pregnant women sought medical care, just 50.3% of them knew at least a danger sign of severe NNJ and 14.8% would use extract of unripe papaya for its treatment. These studies showed poor health seeking behaviors among expectant mothers in Nigeria.

(Jahan et al., 2022) in Bangladesh, reported that most mothers (56%), (58%) and (62.7%), respectively, resorted to herbal remedies. Similarly, (Amidu et al., 2022) in Tanzania reported that most mothers 79% applied hazardous methods such as cutting the baby's eyebrows, the back of the ear and other parts of the body with a blade as their culture demands in the management of NNJ. Nevertheless, (Olatunde et al., 2022) in Nigeria and (Salia et al., 2021) in Ghana revealed that 78.2% and 84.3% of mothers respectively sought medical attention immediately after recognizing any sign of jaundice. However, the variation from the findings can be attributed to the study setting. Women who resided in rural areas engaged in poor socio-cultural practices such as giving their infected babies herbal remedies. In view of the different education levels and cultural practices, these factors should be taken into consideration during the design of educational materials and their methods of delivery (Lokossou et al., 2021). Nevertheless, the above health seeking behavior are alarming as the delay in seeking medical treatment for NNJ can lead to severe hyperbilirubinemia and this may contribute significantly to neonatal morbidity and mortality. Hence, in order to reduce such malpractices in the community, health educational talks and engagements should be designed to find out the various activities mothers engage in at home in the management of NNJ.

Health education is one of the essential elements in the delivery of Primary Health care as dictated by the Alma Ata conference (1978) is expected to be conducted from the Primary Health Centers (PHCs) in an effective manner. The national "Plan of Action for activities of the PHCs,

which us revised annually emphasizes that health information on antenatal care and related matters must be properly disseminated so that women can improve their knowledge, attitude and skills for a healthy pregnancy and delivery. Provision of health education during pregnancy has been shown to be an important aspect of prenatal care.

In a study of educational intervention on neonatal jaundice by (Boo et al., 2019), higher level of baseline knowledge achieved in mothers that 93.8% of them knew about neonatal jaundice; however one-third of mothers were aware that jaundice appearing during the first 36 hours of life was abnormal and less than 20% knew about glucose-6-phosphate dehydrogenase deficiency and that fetal-maternal blood group differences could cause jaundice. Also, only 38.4% of them were aware that severe jaundice could result in hearing impairment and only 27.1% of them were aware that putting jaundiced infants under the direct sun could result in dehydration and worsening of jaundice.

In their study, the knowledge of neonatal jaundice was significantly influenced by their level of education. Moreover, an intervention study showed that the rate of insufficiently informed mothers was well above average and low education level was found to increase the probability of the mothers' knowledge level to be insufficient (Shojaei et al., 2022). In total, it seems that the level of knowledge and behavior to neonatal jaundice, its complications and the best way for its management is considerably low in our population and also, in most developing nations emphasizing implementation of various training programs to improve understanding of these mothers to neonatal jaundice.

This approach has been associated with a broad variety of maternal and child health outcomes including reduced prematurity and low birth weight, and increased rates of initiation and continuation of breastfeeding. Considering the potential outcomes of health education schemes targeting pregnant women, health teams must strive to incorporate and perform education activities to prepare pregnant women for childbirth and the postpartum period. However, it is crucial to understand that there are multiple contexts, and pregnant women represent multiple demographic groups. The strategies must be specifically designed to provide the desired outcomes for different target groups (WHO, 2019)

Findings from Ezeaka et al (2014) showed that maternal perceptions generally dictates the modern medical treatments to neonatal jaundice; in addition, there was obvious influence of

family and societal values in the maternal actions. It was discovered that most of these mothers erroneously believed that jaundice is not a serious issue and does not need any important medical intervention. As a result, oral medications and/or herbal preparations are often used by them. Hence this study will evaluate the effect of educational intervention on health seeking behavior of pregnant women regarding neonatal jaundice in selected senatorial district in Ilorin, Kwara State

Research Questions

The specific research questions of this study are:

1. What is the baseline health seeking behaviour of pregnant women towards neonatal Jaundice in the control and experimental group?
2. What is the influence of health education on the health seeking behaviour of pregnant women towards neonatal Jaundice in the experimental group?

Research Objectives

1. To determine baseline health seeking behaviour of pregnant women towards neonatal Jaundice.
2. To determine the impact of health education on the health seeking behaviour of pregnant women towards neonatal Jaundice.

Hypothesis

H_{01}: There will be a significant difference in health seeking behavior of pregnant women in the experimental group at baseline and at 8th week follow-up

Methodology

The research design that was utilized for this study is Quasi-experimental which is similar to true experiments. The sample size for this study was calculated to be 64 participants per group using the Power Formula, which makes a total of 128. A multi-stage sampling procedure was used to select pregnant women for health education interventions from Two Primary Healthcare facilities (PHCs) which were selected purposefully per LGA Ilorin West – Adewole PHC & PHC Alanamu; Ilorin East- PHC Okelele & Awodi PHC -Central; Ifelodun – Ganmo BHC &PHC

Idofian; Oke- Ero – PHC Idofin Igbana I & Idofin odoashe PHC which made a total of Eight PHC's in the state.

The research entailed the identification of two senatorial districts within Kwara State, namely Kwara Central and Kwara South. Areas under local government were subsequently chosen to comprise 37% of the districts. The areas that were chosen were allocated at random into control and intervention groups, which included eight (8) Primary Health Centres (PHCs). Information was gathered at baseline from participants in all eight PHCs. Following the researcher and research assistant into the intervention phase was a four-week training module. At the conclusion of the intervention, post-intervention assessment data were gathered from participants in order to ascertain the intervention's efficacy in modifying expectant women's health-seeking behaviour with respect to neonatal jaundice**.**

Data analysis

Data was analysed using statistical package for social sciences (SPSS) version 23. Descriptive statistics was used for comparison of baseline, immediate post-intervention and follow-up period. The socio-demographic variables were tested for randomization between the two groups. The mean value and standard deviation for the scores was calculated and compared between and within the two groups using T-test per subject (baseline, immediate post-intervention, and follow-up). Hypotheses were tested using inferential statistics such as paired T-test, to compare the means of two groups.

Ethical consideration

Babcock University Health Research Ethics Committee granted this study's ethical approval (BUHREC). Informed consent was also documented from each respondent stating their willingness and approval to participate in the study at any time without penalty while maintaining confidentiality.

RESULTS

A total of 128 participants were recruited to take part in the study. All the participants in the intervention group, as well as the control group completely and correctly filled the questionnaire, giving a response rate of 100%.

Baseline Comparison of the Socio-demographic Characteristics of the participants across the Groups (Intervention and Control Group)

The result of the analysis showed that the mean age and standard deviation of the participants in the control and experimental group were 30.34±5.09 and 29.59±4.92 respectively, with more than a quarter of the participants in the control group 18 (28.1%) and the experimental group 16 (25.0%) between the age range of 23-27 years. Most of the respondents in the control group 43 (67.2%) as well as the experimental group 46(71.9%) were Christians. Concerning participants occupation, the result of the analysis revealed that less than half of the participants in the control group 22(34.4%) and the experimental group 14(21.9%) were businesswomen, as only a few in the control group 4 (6.3%) and experimental group 10(15.6%) were civil servants. The result of the analysis further showed that a significant proportion of the participants in the control group 36(56.3%) and experimental group 55(85.9%) were married (See table 1)

The result of the analysis revealed that 38 (59.4%) of the participants in the control group and the experimental group 35 (54.7%) earned a tertiary degree, while most of the participants' spouses in the control group 43 (67.2%) and experimental group 39 (60.9%) earned a tertiary degree. The result of the analysis revealed that the current gestational period of the participants in the control was between 22-31 weeks while the experimental group was between 26-39 weeks. The result of the analysis revealed that 33 (51.6%) of the participants in the control group and the experimental group 36 (56.3%) were of the Yoruba ethnic group. The result of the analysis further showed that a significant proportion of the participants in the control group 26 (40.6%) and the experimental group 39 (60.9%) had at least one birth. Both groups are considered comparable when looking at socio-demographic characteristics as depicted in table 2.

Table 1: The socio-demographic characteristics of the experimental and control group at the baseline

Variable	Domain	Control group (n=64)		Experimental group (n= 64)		$\chi 2$	P
		F	%	F	%		
Age	18-22	4	6.3	5	7.8	1.41	.843
	23-27	18	28.1	16	25.0		
	28-32	22	34.4	27	42.2		
	33-37	14	21.9	10	15.6		
	38-40	6	9.4	6	9.4		
Mean age ±SD		**30.34±5.09**		**29.59±4.92**			
Religion	Christian	43	67.2	46	71.9	3.80	.150
	Muslim	15	23.4	17	26.6		
	Others	6	9.4	1	1.6		
Occupation	Civil servant	4	6.3	10	15.6	7.59	.108
	Banker	8	12.5	4	6.3		
	Business	14	21.9	22	34.4		
	Hairdresser	22	34.4	14	21.9		
	Tailor	16	25.0	14	21.9		
Marital status	Single	20	31.3	9	14.1	16.14	.001
	Married	36	56.3	55	85.9		
	Divorced	4	6.3	-	-		
	Widow	4	6.3	-	-		
Level of education	Primary	2	3.1	-	-	2.59	.273
	Secondary	24	37.5	29	45.3		
	Tertiary	38	59.4	35	54.7		
Spouses level of education	Primary	1	1.6	4	6.3	2.02	.364
	Secondary	20	31.3	21	32.3		
	Tertiary	43	67.2	39	60.9		

Table 2: The socio-demographic characteristics of the experimental and control group at the baseline

Variable	Domain	Control group (n= 64)		Experimental group (n= 64)		χ2	p
		F	%	F	%		
Ethnicity	Yoruba	33	51.6	36	56.3	4.60	.331
	Nupe	11	17.2	5	7.8		
	Bariba	6	9.4	3	4.7		
	Igbo	6	9.4	10	15.6		
	Hausa	8	12.5	10	15.6		
Number of births	One	26	40.6	39	60.9	5.86	.053
	Two	19	29.7	10	15.6		
	More	19	29.7	15	23.4		

Baseline comparison of participants' health seeking behavior regarding Neonatal Jaundice

The result of the analysis revealed that participants' health seeking behavior was 12-point rating scale, and categorized into poor (0-5.9), and good (6.0-12.0). The result revealed that participants in the control group had a mean health seeking behavior score of 7.80±2.07 while the participants in the experimental group had a mean score of 8.28±2.11 at the baseline. An independent sample t-test was used to compare differences in mean score between the control group and the experimental group. The result revealed that there was no significant difference in the participants health seeking behavior at the baseline, t (126) = -1.31, p = .19. as shown in table3 below:

Table 3: Baseline comparison of participants' health seeking behavior towards neonatal Jaundice in the control and experimental group.

Variable	Maximum points on scale of measure	Control group. N = 64		Experimental group N = 64		P Value
		X(SE)	±SD	X(SE)	±SD	
Health seeking behavior	12	7.80 (0.26)	±2.07	8.28(0.26)	±2.11	0.19

Table 4: Comparison of participants' health seeking behavior in the control group before and at the immediate post intervention.

Variable	Maximum points on scale of measure	Baseline		Immediate post intervention		P Value
		X(SE)	±SD	X(SE)	±SD	
Health seeking behavior	12	7.80(0.26)	2.07	7.80(0.26)	2.07	

As shown in Table 4 above, participants' health seeking behavior was measured on a 12-point rating scale. The result of the analysis revealed that the mean health seeking behavior score and standard deviation of the participants in the control group was 7.80±2.07 at the immediate post intervention. A paired sample t-test was conducted to compare the mean difference between the baseline and the immediate post intervention. The result revealed that there was no significant difference in the health seeking behavior score in the control group at the immediate post intervention.

Comparison of participants' health seeking in the experimental group before and at the immediate post intervention

Participants' health seeking behavior was measured on 12-point rating scale. The participants in the experimental group had a mean health seeking behavior score of 9.52±1.69 (Table 5) at the immediate post intervention. The result from the pre-test (M = 8.28, SD = 2.11) (Table 6) and post-test (M = 9.52, SD = 1.69) of health seeking behavior indicate that the intervention program resulted in an improvement in the health seeking behavior of the participants in the experimental group, t (63) = -5.09, $p < .001$.

Table 5: Comparison of participants' health seeking behavior in the experimental group before and at the immediate post intervention.

Variable	Maximum points on scale of measure	Baseline		Immediate post intervention		P Value
		X(SE)	±SD	X(SE)	±SD	
Health seeking behavior	12	8.28(0.26)	2.11	9.52(0.21)	1.69	0.001

Impact of intervention program on the health seeking behavior of participants in the intervention group

The mean health seeking score of the respondents increased significantly from 8.28±2.11 before the intervention to 9.52±1.69 after the intervention, t (63) = -5.09, $p = .001$ The mean difference showed an effect size of -0.65 with a p value of .001as shown in Table 6

Table 6: Impact of intervention program on the health seeking of participants in the experimental group at the immediate post intervention

Variable	Experimental group		*ES (95% CI)	P
	Baseline N= 64	Post intervention N=64		

	$\bar{x}$(SE)	±SD	$\bar{x}$(SE)	±SD		
Health seeking behavior	8.28(0.26)	2.11	9.52(0.21)	1.69	-0.65(-0.98 to -0.32)	0.001

Participants' health seeking behavior was measured on a 12-point rating scale (Table 7). The result of the analysis revealed that the mean health seeking behavior score and standard deviation of the participants in the control group was 7.80±2.07 at the follow-up period. A paired sample t-test was conducted to compare the mean difference between the baseline and the 8th week follow-up period. The result revealed that there was no significant difference in the health seeking behavior score in the control group at the 8th week follow-up period.

Table 7: Comparison of participants' health seeking behavior in the control group before and at the follow-up post intervention.

Variable	**Maximum points on scale of measure**	**Baseline**		**8th Follow-up**		**P Value**
		X(SE)	**±SD**	**X(SE)**	**±SD**	
Health seeking behavior	**12**	**7.80(0.26)**	**2.07**	**7.80(0.26)**	**2.07**	

Comparison of participants' health seeking behavior in the control group before and at the 8-week follow-up

Participants' health seeking behavior was measured on 12-point rating scale. The participants in the experimental group had a mean health seeking behavior score of 10.82±1.28 at the follow-up period. The result from the pre-test (M = 8.28, SD = 2.11) and post-test (M = 10.83, SD = 1.28) of health seeking behavior indicate that the intervention program resulted in an improvement in

the health seeking behavior of the participants in the experimental group, t (63) = -11.38, $p < .001$.(Table 8)

Table 8: Comparison of participants' health seeking behavior in the experimental group before and at the follow-up period.

Variable	Maximum points on scale of measure	Baseline		Immediate post intervention		P Value
		X(SE)	±SD	X(SE)	±SD	
Health seeking behavior	12	8.28(0.26)	2.11	10.82(0.16)	1.28	0.001

Comparison of participants' health seeking in the experimental group before and at the 8th week follow-up period

Impact of intervention program on the health seeking behavior of participants in the intervention group The mean health seeking score of the respondents increased significantly from 8.28±2.11 before the intervention to 10.83±1.28 after the intervention, t (63) = -11.38, $p = .001$ The mean difference showed an effect size of -1.47 with a p value of .001(See Table 9)

Table 9: Impact of intervention program on the health seeking of participants in the experimental group at the follow-up period.

Variable	Experimental group				*ES (95% CI)	P
	Baseline N= 64		Post intervention N=64			
	x̄(SE)	±SD	x̄(SE)	±SD		
Health seeking	8.28(0.26)	2.11	10.83(0.16)	1.28	-1.47(-1.77 to -1.17)	0.001

Test of Hypotheses

H_{01}: There will be no significant difference in the health seeking behavior of the pregnant women towards neonatal jaundice at baseline and 8 weeks post intervention in Ilorin, Kwara State in the experimental group.

A paired sample t-test conducted revealed that there was a significant difference in the health seeking behavior of participants before the intervention and at the 8th week post intervention (t_{63} = -11.38, p<.001,). However, there was no significant difference in the control group. Therefore, the null hypothesis is hereby rejected in favor of the alternative hypothesis.

Table 10: Paired Samples T-Test showing differences in the health seeking behavior between Baseline and 8th week follow-up period in the experimental group.

Groups	Variable	Paired Differences					t	df	p
		Mean	SD	Std. Error	95% CI Lower	95% CI Upper			
Experimental	**Health seeking behaviour**	-2.55	1.79	0.22	-2.99	-2.10	-11.38	63	0.001

DISCUSSION

The present study investigated the impact of health education on the health seeking behavior regarding neonatal jaundice among pregnant mothers in selected antenatal clinics in Ilorin, Kwara State, Nigeria using the health belief model. The current study found out that there was no significant difference between the control and intervention group regarding mean age, religion, occupation, women and husband's education ethnicity, and number of births. This finding is similar to the study conducted by Khalaf et al., (2019) who reported that there was no significant difference between the study and the control groups regarding mean age, women's and husband's education, residence, mean gestational age and occupation. Correspondingly, Kashaki et al.,

(2016) revealed in their study that there was no significant difference between the intervention group and the control group for gender distribution of neonates, mean gestational age, mean age of onset of jaundice, mean birth weight, and mean level of serum haemoglobin. The current study also conforms to the findings of Ragab, et al., (2019) who reported that there was no difference in the control and intervention group regarding age, mother and fathers' level of education, occupation and gestational age. The current study found out that the participants in the control group had a mean age and standard of 30.34±5.09 while the intervention group had a mean age and standard deviation of 29.59±4.92. This finding is similar to the findings of Khalaf et al., (2019) who reported that the control and intervention group had a mean age of 25.81±5.2 and 27.02±6.1. The present study found out that a significant proportion of the participants in the control and intervention groups were Christians, married, earned a college degree and were from the Yoruba ethnic group.

The present study found out that the participants in the intervention group had a better health seeking behavior at the follow-up period compared to the control group. This finding is similar to the finding of Khalaf et al., (2019) that during the follow-up period, the number of NNJ days were significantly lower in the study group compared to the control group after the program. Also, they reported in their study that the pregnant women who received the educational program in the study group were significantly increasing breast feeding during Neonatal period when compared with their counterparts in the control group. The current result was also concurrent with Guled, et al., (2018) who stated that the pregnant women's practice as regards Breastfeeding (BF) was increased after the program intervention. The study's findings may support the positive impacts of training programs using a variety of materials, such as brochures and program sessions, on raising awareness of NNJ and its practices, as well as the value of breastfeeding in enhancing it. The findings of the current investigation align closely with those reported by Khalaf et al. (2019). In their research, Khalaf et al., (2019) evaluated the impact of educational interventions grounded in the Health Belief Model (HBM) on pregnant women's knowledge and perspectives concerning neonatal jaundice. Their study revealed that the implementation of a structured educational program markedly enhanced the knowledge and attitudes of the participants within the study cohort. This improvement was not only statistically significant but also translated into positive outcomes for the newborns.

CONCLUSION

Based on the current study results it can be concluded that the health seeking behavior of the participants in the intervention group increased significantly compared to the control group. At the follow-up period, participants in the intervention group continued to exhibit increased knowledge, perception and health seeking behaviour while the control group remained the same.

Recommendations

Based on the current study findings, the researcher recommends that:

1. Routine health educational program should be implemented for pregnant women regarding neonatal jaundice.

There is need for scaling up this study as the feasibility of the intervention has been documented by this study- other LGA.

Suggestion for further Studies

1. Further research should be conducted to evaluate women practice regarding neonatal jaundice.
2. Future studies should evaluate the effectiveness of antenatal health education and reasons why certain ethnic groups prefer not to seek care in health facilities.

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