

## Conference Paper

# Description of health urinary system during pregnancy in Kedungwuni I Public health center Pekalongan

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## Abstract

**Background:** Pregnancy brings many impacts to womens' health un-avoidably their urinary system. But least attention put to this problem. Ignored urinary system problems may cause complication for both mother and her baby such as prematurity, IUFD, LBW and pre-eclampsia. **Objective:** this study purposed to identify the health status description of pregnant women urinary system in Kedungwuni 1 Public Health Center Pekalongan region. **Method:** This descriptive study involved 83 participants recruited using accidental sampling. Check list for physical assessment and questionnaire were used for data collection. **Result:** from total of 83 pregnant mothers, 40 of them were on second trimester, 82% of participants of this study were aged from 20-35 years old, most of them were junior high school graduate (42.2%) and more than half of them (54.2%) were housewife. 13.3% of participants stated feeling the pain during suprapubic palpation and lower back percussion. 25.3% mothers mentioned that they used to postpone urination, 32.5% complained for unfinished urination and 32.5% complaining hot sensation when urinate. **Conclusions:** this study showed that more than a quarter of the participants in this study exhibit signs and symptoms of urinary tract infection. To prevent the adverse effect caused by urinary tract infection on pregnant mothers, it is suggested to all health care providers involved to put more attention to this matter.

**Keywords:** Pregnancy, Urinary System, Urinary Tract Infection

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## 1. Introduction

Indonesia was on the second ranked in terms of the health problems of mothers and babies from all countries in ASEAN. The target of reducing maternal mortality rate could not be reached at 102 / 100,000 live births, the maternal mortality rate recently was still at 305 / 100,000 live births. Every day there are two mothers and eight babies die in Indonesia. The maternal mortality rate in Central Java in 2012 was 675 / 100,000 live births, in 2014 there were 644 / 100,000 live births and in 2015 there were 668 / 100,000 live births. The maternal mortality rate in Pekalongan was on seventh ranked in all city districts in Central Java. There were 29 cases of maternal deaths in Pekalongan in 2014. The highest case of pre-eclampsia reached 16 cases.

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Pre-eclampsia is one of the causes of maternal death. Pre eclampsia is a condition of pregnant with high blood pressure and followed by other symptoms such as edema, proteinuria, etc. Several overseas studies have found that in pre-eclampsia patients identified the presence of microorganisms in their urine. These microorganisms may cause urinary tract infections. Urinary tract infections in pregnancy often do not cause symptoms or asymptomatic so they are less noticed. [1] about 2% to 12% of pregnant women experience asymptomatic bacteriuria.

[2] the progress of pregnancy, the enlarged uterus can press against the ureter when passing through the edge of the pelvis and cause further dilatation by blocking the ureteral flow. Urinary resistance to be released becomes a medium for microorganisms that cause urinary tract infections. One type of urinary tract infection is pyelonephritis. Pyelonephritis is a common symptom most commonly found in the second trimester of pregnancy. Only 4% of cases were reported in the first trimester and 67% of cases were reported in the second trimester and third trimester, and 27% were reported in the postpartum period.

[1] stated that lower urinary tract infection (cystitis) is one of the most common bacterial infections experienced by women. Most UTIs begin with the invasion of *Escherichia Coli* (80% -90%). Most of the remaining cases were caused by *Staphylococcus saprophyticus* and *C. Trachomatis*. [2] pathogenic bacteria that can cause urinary tract infections are *Citrobacter koseri* and *Citrobacter amalonaticus*, *C. Freundi*, *Pseudomonas*, *Enterococcus*, *Streptococcus*.

Based on the study of the results of research in Indonesia, the disease of the infectious tract has not been discussed much, even though the condition of urinary tract infections can lead to preeclampsia, low birth weight, premature, death of the womb (Intra Uterin Fetal Death) [2]. The premature birth rate in Indonesia ranks fifth from countries in the world. Premature babies are a condition of babies born before 37 weeks of gestation, the baby's organs are immature so the work function is not maximal. These conditions can cause a baby breathing problems such as asphyxia, disruption in liver function in the form of pathological icterus, thermoregulation disorders in the form of young hypothermia, and other conditions of the disorder. The condition of pain in these infants increases the risk of increased infant mortality. The Global Action's "born to soon" reports that Indonesia is the fifth largest country in the world with up to 675,700 babies in 2010. Premature babies (23 weeks - 28 weeks) are at risk of developing Cerebral Palsy, ADHD, vision problems, hearing problems, digestive problems, risk of infection, risk of sudden death (SIDS). Premature babies have the potential to fail to grow [3]. Urinary tract infections with *E. coli* are non-genital tract infections that can trigger premature

labor. The 2012 Indonesia Basic Health Survey, mentioned from every 1,000 births in Indonesia, there were 19 intra uterine fetal death [4]. Sutarjo Untung Suseno [4] stated that every day there are two mothers and eight newborn babies who die.

## 2. Methods

The research has been carried out aims to find out the description of the knowledge of pregnant women regarding the health of the urinary system in the working area of the first health center in Pekalongan district. This research is a quantitative, descriptive type. The variable of this study were the health of the urinary system, while the respondents of this study were pregnant women in all gestational ages. The research site is in the working area of the Kedungwuni I health center in Pekalongan district, Kedungwuni Timur village, Podo village and Salakbrojo village. The study was conducted at the village hall of the three villages. The sampling technique uses accidental sampling. The number of respondents in the study was 83 pregnant women. The research instrument uses a questionnaire that has been tested for reliability validity with the results of the validity test 0, 691, and the reliability test  $\alpha$  chronbach value 0.716. This study also uses a physical examination including examination of body temperature using a digital thermometer, blood pressure examination using a sphygmomanometer type to take the blood pressure, palpation examination in the symphysis pubis area, percussion tap examination in the lower back area. Researchers conducted the short briefing to have equal perception in collecting the data in advance, explain the research process, research objectives, research benefits, research procedures, the rights of research respondents, filling out questionnaires, and physical examinations conducted.

One limitation of this study is that the researcher did not carry out a urine culture examination on the study respondents' mothers so that the results of the study were certain that the health of pregnant women was not entirely clearly identified. Urine culture examination should be used to determine the presence or absence of bacteria in the urine, considering that urinary tract infections sometimes do not show signs and symptoms (asymptomatic). The questionnaire in this study consisted of questions on the characteristics of pregnant women who were respondents of this study, other questions focused on the symptoms of upper urinary tract infections, signs of lower urinary tract infections, drinking habits during pregnancy, habits of cleaning genitals. The questions in the questionnaire are closely related to the health of the urinary system during pregnancy.

### 3. Results

The results of the study illustrated the characteristics of pregnant women who came to the three village halls in the working area of the Kedungwuni I health center in Pekalongan district, during the study. In addition to the characteristics of the respondents of the study, the research variables on urinary system health in pregnant women produced blood pressure, body temperature, health of pregnant women based on symptoms of lower urinary tract infections, health of pregnant women based on signs of upper urinary tract infection, health of pregnant women based on drinking habits, health of pregnant women based on the habit of maintaining genital hygiene. The results of the study have been presented in the following tables:

TABLE 1: Distribution of Respondents by Age of Pregnant Women (n=83).

No	Age of Pregnant Women	Frequency	Percentage
1	< 20 years old	1	1 %
2	20 years old – 35 years old	68	82 %
3	> 35 years old	14	17 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

Based on the table, it can be seen that the age of most respondents in the healthy age category of pregnancy between 20 years and 35 years was 68 people (82%), but there were 14 (17%) mothers who passed the healthy age of pregnancy

TABLE 2: Distribution of Respondents Based on Level of Education of Pregnant.

No	Level of Education	Frequency	Percentage
1	Elementary School	24	28,9 %
2	Junior High School	35	42,2 %
3	Senior High School	19	22,9 %
4	College	5	6 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

Based on the table, it can be seen that the most respondents with 35 percent junior high school education (42,2%)

Based on the table it can be seen that respondents with the work of housewives are 45 people (54.2%), there are 19 (23%) as laborers, and 3 people (3.6%) as educators.

Based on the table, it can be seen that the most respondents in the second trimester of pregnancy (4-6 months) are 48.2%. There were 30 people (36.1%) of pregnant women whose third trimester of pregnancy (7-9 months).

Based on the table it can be seen that respondents who have a risk of lower urinary tract infections as many as 18 people (21.7%)

TABLE 3: Distribution of Respondents by Occupation of Pregnant.

No	Occupation	Frequency	Percentage
1	Labour	19	23 %
2	Private Employee	5	6 %
3	Entrepreneur	5	6 %
4	Trader	6	7,2 %
5	Educationalist	3	3,6 %
6	Housewife	45	54,2 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 4: Distribution of Respondents by gestational age.

No	Age of Pregnancy	Frequency	Percentage
1	Trimester I (0-3 Months)	13	15,7 %
2	Trimester II (4-6 Months)	40	48,2 %
3	Trimester III (7-9 Months)	30	36,1 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 5: Distribution of Respondents Based on Symptoms of Lower Urinary Tract Infection.

No	Lower Urinary Tract Infection	Frequency	Percentage
1	High Risks	0	0
2	Medium Risks	18	21,7 %
3	Lower Risks	65	78,3 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 6: Distribution of Respondents Based on Symptoms of Upper Urinary Tract Infection.

No	Upper Urinary Tract Infection	Frequency	Percentage
1	High Risk of Infection	3	3,6 %
2	Medium Risk of Infection	13	15,7 %
3	Low Risk of Infection	67	80,7 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 7: Distribution of Respondents Based on Urinary Habits.

No	Urinary Habits	Frekuensi	Prosentase
1	Bad habits	9	10,8 %
2	Good habits	74	89,2 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

Based on this table, it can be seen that the body temperature of respondents during the study took place there were 46 people (55.4%) body temperature below normal and there were 1 person (1.2%) body temperature above normal condition.

TABLE 8: Distribution of Respondents Based on Drinking Habits.

No	Drinking Habits	Frequency	Percentage
1	High Risk of Infection	0	0 %
2	Medium Risk of Infection	3	3,6 %
3	Low Risk of Infection	80	96,4 %
	<b>Total</b>	<b>83</b>	

TABLE 9: Distribution of Respondents Based on Habits of Cleaning Female Areas.

No	Habits of Cleaning Female Areas	Frequency	Percentage
1	High Risk of Infection	0	0 %
2	Medium Risk of Infection	1	1,2 %
3	Low Risk of Infection	82	98,8 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 10: Distribution of Respondents Based on Body Temperature.

No	Body Temperature	Frequency	Percentage
1	< 36,5	46	55,4 %
2	36,5 – 37,5	36	43,4 %
3	>37,5	1	1,2 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

TABLE 11: Distribution of Respondents Based on Systole Blood Pressure.

No	Systole Blood Pressure	Frequency	Percentage
1	90 mmhg	6	7,2 %
2	100 mmhg	18	21,7 %
3	110 mmhg	32	38,6 %
4	120 mmhg	22	26,5 %
5	130 mmhg	2	2,4 %
6	140 mmhg	2	2,4 %
7	150 mmhg	1	1,2 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

Based on the table it can be seen that the most respondents with 110 mmhg systole blood pressure are 32 people (38.6%), but there are 2 people (2.4%) systole blood pressure 140 mmhg and 1 person (1.2%) blood pressure 150 mmhg.

Based on the table, it can be seen that the respondents with the most diastolic blood pressure is 70 mmHg, 36 people (43.4%), but there are 6 people with high diastole blood pressure 90 mmhg, as many as 6 people (7.2%) and 1 person with diastolic blood pressure 100 1 person mmhg (1.2%)

TABLE 12: Distribution of Respondents Based on Diastole Blood Pressure.

No	Diastole Blood Pressure	Frequency	Percentage
1	60 mmhg	5	6 %
2	70 mmhg	36	43,4 %
3	80 mmhg	35	42,2 %
4	90 mmhg	6	7,2 %
5	100 mmhg	1	1,2 %
	<b>Total</b>	<b>83</b>	<b>100 %</b>

## 4. Discussion

[5] Stated that urinary tract infections according to international disease classification are infections that affect the secretion and elimination of urine in the kidneys, ureters, bladder and urethra. Urinary tract infections can occur in women before pregnancy or during pregnancy. Urinary tract infections that occur can show signs of symptoms, some are not showing signs of symptoms. These conditions cause delays in handling considering the identification of signs and symptoms these days are of less concern. Though the impact of UTI on pregnancy can be detrimental to both the mother and the fetus [6].

UTI has a large role in increasing the number of stillbirths. Weight and height of newborns from mothers suffering from UTI ( $P < 0.001$ ) were significantly lower compared to newborns of healthy women ( $P < 0.001$ ). There was a significant relationship between the two groups of pregnant women with UTI in normal labor and caesarean delivery ( $P < 0.008$ ). An increasing number of low birth weight babies have an extraordinary correlation with UTI, which can affect the health of the next generation [7].

Emamghorashi, et. al. (2012, in Amiri, 2013) the average weight of newborns whose mothers had a UTI was 2886.66 grams and 282.5 grams lower than newborns of healthy mothers. The study stated that 43.33% of infants in the case group had lower than normal body weight, 11% of the mothers studied with UTI were stillbirths [6]. According to Rowińska, J.M. Urinary tract infections in pregnant women pose a risk of preterm labor. A rare but severe complication of urinary tract infection is the transmission of infection to newborns. [6] Infection of the mother during pregnancy can trigger premature labor and stillbirth in her baby. Stillbirth has been reported to be associated with almost all types of infections, including those caused by bacteria, viruses, and many parasites.

Urinary tract infections and their complications cause nearly 150 million deaths per year worldwide[8]. This disease can develop in 40% - 50% of women. UTI is the second common complication in pregnant women after anemia, if not properly controlled, can

affect the health of the baby or pregnant mother. Lower urinary tract involvement, which causes asymptomatic bacteriuria, is the most common cause of UTI during pregnancy. Upper urinary tract involvement can cause symptomatic bacteriuria and is characterized by acute pyelonephritis. The prevalence of symptomatic urinary tract infections in pregnant women is 17.9% and asymptomatic forms in 13%. If an infection without symptoms is not treated, it leads to several clinical manifestations in the mother and newborn.

Untreated or late treatment of urinary tract infections will cause injury to the kidneys which results in an increase in blood pressure, pre-eclampsia in pregnancy. [9] Showed that 15-20% of pregnancies with late urinary tract infections were negatively affected such as pre-eclampsia [9]. In that study pregnant women with pre-eclampsia contained a lot of bacteria in their urine. Pregnant women with preeclampsia have a 7.7 chance of having significant bacteriuria compared to pregnant women who don't have preeclampsia. This condition is a continuation of pyelonephritis which shows the presence of bacteriuria. Pyelonephritis occurs in 2-4% of pregnancies with a recurrence rate of 23% immediately after birth. Pyelonephritis is an upper urinary tract infection where patients can experience fever, tachycardia, dysuria, abdominal pain, nausea and tenderness at the costo-vertebral angle on the affected side. Symptoms of urinary tract infection (UTI) symptoms vary. Half of the patients found to have bacteria in the urine (bacteriuria) show no symptoms. Common risk factors for UTI include the inability or failure of the bladder to empty the contents completely.

#### 4.1. Age of Pregnant Women during Research

The study showed that there were 14 (17%) pregnant women who were respondents of the study who passed the healthy age of pregnancy. The healthy age of pregnancy is 20 years to 35 years. In the study found there are pregnant women who are less than 20 years old and also more than 35 years. [8] Increased age, number of deliveries, number of sexual relations per week, diabetes, recessive sickle cell anemia, previous UTI history, immunodeficiency and urinary tract abnormalities can increase the risk of UTI in pregnant women [10]. In several studies Mobbasheri et al. Research in Gorgan, he showed that urinary tract infections were more common in pregnant women with maternal age over 35 years (8.4%). Although the Al-Haddad AM study. Research in Yemen showed an infection in pregnant women with maternal age 15-24 years (53.7%).



## 4.2. Age of Mother's Pregnancy During Research

The results showed that the highest number of respondents in the second trimester of pregnancy (4-6 months) was 48.2%. There were 30 people (36.1%) of pregnant women whose third trimester of pregnancy (7-9 months). According to [8] The incidence of UTI increases in pregnancy. Based on previous research, the possibility of UTI starts in the sixth week. This probability peaks at 22-24 weeks of gestation. The reason for the increased possibility of infection in pregnant women is likely to be an increase in bladder volume and its expansion and expansion of the ureter. Anatomic and physiological changes that occur during pregnancy change the course of bacteriuria and make pregnant women more vulnerable to UTI complications such as pyelonephritis [9].

According to [8], the highest incidence of UTI among pregnant women in the second pregnancy and the lowest infection rate after the third pregnancy, however, in a study conducted by Mobbasheri and et al. [8] in Gorgan, the highest infection rate was after the third pregnancy (4.73%). Rowińska, J.M, et.al stated that acute pyelonephritis most often occurs in advanced pregnancy, with 80-90% of cases occurring in the second and third trimesters. The research that researchers have done does not identify the number of parity [5].

## 4.3. Mom's Education During Research

The results showed that most respondents with 35 percent junior high school education (42.2%). This is the same as the results of research abroad, pregnant women who experience urinary tract infections more in pregnant women who have less educational background from high school to high school. It is possible that knowledge about health in general and knowledge about the health of the urinary system in particular is not widely understood, so that the behaviors displayed in daily life are lacking in maintaining health, including the health of the urinary system during pregnancy. That education & knowledge about the importance of fulfilling drinking water needs during pregnancy are very effective in fulfilling the fluid needs of pregnant women. [8] the main action in reducing the risk of infection and complications in pregnant women is by creating awareness about the causes and symptoms of UTI and prevention of the causes, especially by educating women before and during pregnancy.

#### 4.4. Occupation of Pregnant Women When Research

The results showed that the respondents with the work of housewives were 45 people (54.2%), there were 19 (23%) as laborers, and 3 people (3.6%) as educators. The condition is the same as research conducted abroad, where many urinary tract infections occur in pregnant women who work as housewives. The work of housewives is not limited in time and there is no standard operating procedure that is the same, so the possibility of pregnant women does not pay attention to the bladder that is full, emptying of the bladder is not complete, and the habit of cleaning the genitals after urinating is not drained. The research of Badran et al (2015) states that urinary tract infections depend on 8% socioeconomic conditions. This is different from the study of Sheikh (2000) which states that socioeconomic there is no significant relationship with the incidence of urinary tract infections[11].

#### 4.5. Blood pressure

Based on table 5.5 most respondents with blood pressure systole 110 mmhg as many as 32 people (38.6%), but there are 2 people (2.4%) systole blood pressure 140 mmhg and 1 person (1.2%) blood pressure 150 mmhg. Whereas table 5.6 of respondents with the highest diastolic blood pressure was 70 mmHg, namely 36 people (43.4%), but there were 6 people with high diastolic blood pressure 90 mmHg (7.2%) and 1 person with diastolic blood pressure 100 mmHg of 1 person (1, 2%). So based on research that has been done there are 3 people with blood pressure systole more than normal and 7 people with blood pressure diastole more than normal. So it can be concluded based on the results of the study that there are as many as 7 people (8.4%) with high blood pressure[5]. Around 15-20% of women with pyelonephritis suffer from bacteremia. Complications of urinary tract infections include acute kidney injury, anemia, hypertension, preeclampsia, sepsis and septic shock, hemolysis, thrombocytopenia, and acute respiratory distress syndrome, especially if treatment is started late.

#### 4.6. Symptoms of Lower Urinary Tract Infection & Symptoms of Upper Urinary Tract Infection

The results of this study indicate that respondents who have a risk of lower urinary tract infections are 18 people (21.7%). Symptoms of lower UTI (cystitis) include frequent pain and burning sensation when urinating, sometimes accompanied by spasm in the bladder and suprapubic areas. Hematuria with back pain can occur. The results of

this study also showed that respondents who were at risk of developing urinary tract infections were 13 people (15.7%). Signs and symptoms of upper UTI (pyelonephritis) include fever, chills, pelvic pain, and pain when urinating. Physical examination shows pain and tenderness in the costovertebral angle (CVA) area.

[8] Involvement of the lower urinary tract, which causes asymptomatic bacteriuria, is the most common cause of UTI during pregnancy. Upper urinary tract involvement can cause symptomatic bacteriuria and is characterized by acute pyelonephritis. The prevalence of symptomatic urinary tract infections in pregnant women is 17.9% and asymptomatic forms in 13%. If an infection without symptoms is not treated, it leads to several clinical manifestations in the mother and newborn. The 78 patients analyzed, 79% experienced an increase in urinary frequency, 73.1% had suprapubic pain and 53.1% had dysuria[12].

#### 4.7. Urinary Habits

The results showed a good category of urination habits as many as 74 people (89.2%), meaning that more than half of the respondents already know and get used to good urination. Stagnated urine is an excellent medium for the growth of microorganisms. The urine of pregnant women contains greater amounts of nutrients including glucose. Therefore during pregnancy women are more susceptible to infections of the urinary tract. Urinary tract infections are characterized by bacteriuria and pyuria (bacteria and leukocytes in the urine)[13]. Infection can occur asymptomatic or symptomatic. Infection can occur only in the kidneys (pyelonephritis) or it can also occur in the bladder (cystitis). Urinary tract infections (UTI) are most common in women given the location of the urethra that is close to the rectum, intrinsic bacteria easily colonize. Besides the short urethra and urethral trauma during sexual intercourse, facilitate the entry of bacteria into the bladder.

Bladder-level obstruction causes incomplete emptying and an increase in residual urine volume. If there is stasis, bacteria that enter the bladder will multiply without interruption. Urine that has been contaminated with bacteria rises along the ureter, infecting the pelvis and renal parenchyma.

#### 4.8. Drinking Habits

The results showed that respondents with good drinking habits were 80 people (96.4%). The results of the study are different from the study which concluded that the majority

of samples of pregnant women in Indonesia had inadequate fluid intake. Kristen S. Montgomery General fluid requirements increase during pregnancy to support fetal circulation, amniotic fluid, and higher blood volume. The current recommendation for water intake is to drink 8-10 glasses of water every day. Increased fluid intake can help relieve constipation. An adequate supply of fluids also ensures that the mother has sufficient reserves to tolerate blood loss during labor. The kidneys function to excrete waste products from the body's metabolism. The remaining substances that must be removed can be interpreted as waste that must be removed. With enough drinking water consumed during pregnancy, the waste that must be removed by the kidneys can be quickly excreted by the urge of fluid that is consumed by many mothers during pregnancy. Adequate fluid consumption in pregnant women keeps urine runny and prevents urinary tract infections. Therefore the actions of midwives, general practitioners and other doctors to promote increased water intake as part of a healthy lifestyle in pregnant women are urgently needed. Research conducted states that education & knowledge about the importance of meeting drinking water needs during pregnancy are very effective in fulfilling the fluid needs of pregnant women. Besides the availability of drinking water, type of bottled water also increases the body's fluid intake for pregnant women. [14] Shows a big difference between patients who usually consume water every day and patients who do not drink water every day. Patients who are accustomed to consuming excessive amounts of soft drinks experience a severe urinary tract infection[14].

#### 4.9. Habit of Cleansing Pubic Areas

The results showed that good habits in cleaning the female area as many as 82 people (98.8%), the condition needs to be maintained so that there is no risk of urinary tract infections. The study of concluded that the main risk factors for UTI identified were incorrect perineal washing techniques, use of synthetic / silk underwear, frequency of replacement of sanitary napkins during menstruation. Behavioral factors play a key role in the cause of urinary tract infections.

Rowińska, J.M, et.al stated that urinary tract infections are usually caused by hygiene of generalities devices that are not given much attention. The condition is usually a consequence of a low UTI (below) that is not diagnosed or treated inappropriately, or complication of 30-40% of cases of untreated asymptomatic urinary tract infections.

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## Conflict of Interest

The authors have no conflict of interest to declare.

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