ANALYSIS OF THE RELATIONSHIP OF LIFESTYLE AND SOME OF THE PARAMETERS OF RESPIRATORY DISEASES OF CHILDREN 7 - 9 YEARS OLD IN POLAND AND UKRAINE

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Annotation. Purpose - defining the relationship between the state of knowledge in the field of preventive health care, lifestyle characteristics, health status of students 7-9 years after an illness of the respiratory system. Developed a diagnostic system for the study of health status and level of physical fitness. Anthropometric measurements were carried out and samples Genchi and Stange, heart rate, blood pressure at rest. The level of adaptation was determined by the method of R.M. Baevsky. Opinion of parents, morphology and function, and medical records 553 students of secondary schools of Kiev and 538 students of Szczecin and Konin. Found that the incidence of respiratory systematically increased. It was found that the lack of physical activity of the body is 60-75% needed to maintain the health and development of physical standards. The ratio of 28 hours of lessons on general subjects with 2 hours of physical training per week in school indicates non-compliance with the physiological regulation of mental and physical stress during the growth and development of children.
Keywords: children, respiratory diseases, health-oriented technology, physical education.

Introduction

Diseases of respiratory system belong are considered to be one of the most serious problem by modern medicine. First of all it is connected with increasing of different micro-organisms' toxins' and allergens' influence on organism. Nowadays, chronic destruction diseases of lungs, cancer of lungs, tuberculosis and pneumonia have become the second by quantity of deaths reason of mortality, after diseases of cardio-vascular system. But in contrast to cardio-vascular system's diseases, frequency of diseases of respiratory organs constantly increases. In practice of any pediatrician infection of respiratory organs is the most important reason of sick children's visits [13, 20]. Considering physiological immaturity of organism's immune system, as well as influence of risk factors (crèche, kindergarten) children of 2-5 years old age are the group, which is most infection-sensitive. Acute bronchitis are the most frequent among children up to 2nd year of life, with it 2 – 3% of cases require hospitalizing. Second wave of morbidity happens at age from 8 to 15 years old, when from 1/5 to 1/3 of all children suffer from bronchitis [14, 17, 18].

The most often reasons of these diseases are viruses, especially RSV and influenza, which create a basis for infection with bacteria, invading nasopharynx. As per the above mentioned infection of air passages, as one of main reasons of acute affecting of junior school age children's respiratory systems, is also main reason of respiratory system's chronic diseases of children [15, 16, 19].

According to statistical data, 2-4 times a year, in winter-spring period there happen cases of virus infection of 7-9 years old children. And that is why correction of content and level health-related means' dozing for such children are one of the most important tasks for specialists in the field of physical education. For its solution it is very important to know, which dependences exist between factors, influencing of children's life style, level of their morbidity and physical activity [8].

In Republic of Poland for 7-9 years old children discipline "Physical education" is taught in compliance with Order of Minister of People's Education, dt. December 23rd, 2008, as a part of program basis of pre-school education and comprehensive education in schools (Rozporządzenia Ministra Edukacji Narodowej z dnia 23 grudnia 2008 r. w sprawie podstawy programowej wychowania przedszkolnego oraz kształcenia ogólnego w poszczególnych typach szkół (Dziennik Ustaw z dnia 15 stycznia 2009 r. Nr 4, poz. 17) (załącznik Nr 2) [20].

Physical education classes are conducted in groups of 3 types, which consist of children, qualified by their physical condition and state of health.

Group A includes children, who are capable to endure physical loads of physical education trainings without limitations, practice sports or attend sport circles in schools or out of schools (sub group As). Group B consists of children, who are capable to endure physical loads with limitations, or require special attention of teacher; sub-group Bk includes children with state of health, requiring additional correcting trainings. Group C includes children, who can not take part in physical trainings owing to their poor health. Sub-group C1 includes children, who pass rehabilitation trainings (kinesio-therapy) Pupils with chronic inflammations of upper air passages are qualified for group B (limitation of trainings in poor atmospheric conditions, at low temperature and in dusty gyms). The same group includes pupils with sinusitis (prohibition to swim, water kinds of sports) Pupils with infection of upper air passages are temporarily qualified to group C.

In Ukraine physical education, as a discipline of comprehensive schools and higher school is taught as per standards of Ministry of Education and Science of Ukraine in three kinds of groups: main health group, preparatory group and special health group. Trainings of special health groups' pupils (students) are conducted out of hours' net, 2

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times a week [5, 9, 11].

Special health group can include children with very weak health and their peers, who, by any reason, previously did not fulfilled any physical exercises.

According to statistical data of Institute of Hygiene, named after Marzeyev, of AMS of Ukraine, for 2010 most often children after acute diseases of respiratory system and after acute respiratory infections at age of 7-10 years old are most often qualified to special health groups [10].

In most of post-Soviet countries and in Ukraine, prophylaxis of respiratory system's diseases and application of physical culture means for their rehabilitation have been studied by many authors: L.S. Zakharova (1988), V.A. Syluyanova (1995), N.L. Ivanova (2000), Ye.V. Sokolov, O.Yu. Yermolayev (2001), M.P. Verevkyna (2002), Ye.Yu. Sedykh, I.A. Vlasova et al, (2002), V.A. Sokolynska (2002), A.Ye. Agapytov (2003), I.I. Nykolayeva (2003), A.O. Okunyeva (2004) [1, 2, 3, 6, 7, 10].

Considering children organism's sensitivity to environmental factors' influences and further growth of acute respiratory system's morbidity, problem of organization of educational processa is rather urgent both for modern Ukraine and for Poland [7, 20].

The researches has been fulfilled as per combined topic of Kyiv university, named after Borys Grynchenko "Philosophical, educational and methodic principles of competence, personality-oriented professional multi-profile university education" (state registration number 0110u006274) for 2011-2015, in the frames of topic "Theoretical-methodic principles of competence personality-oriented professional activity of specialists in the field of physical education of different population's groups" of physical culture and sportsmanship department of Humanitarian institute.

Purpose, tasks of the work, material and methods

The purpose of the research is determination of dependence between state of knowledge in the field of health-related prophylaxis, peculiarities of life style and state of health of 7-9 years old pupils after respiratory organs' diseases.

The tasks of the research:

1.Analysis of literature data about life style, health state, 7-9 years old children's morbidity in Poland and in Ukraine.

2. Carry out comparative studying of life style, of some parameters of respiratory organs' morbidity of 7-9 years old children in Poland and in Ukraine.

3. Determine correspondence of actual 7-9 years old children's motion activity to their physiological age standards in Poland and in Ukraine.

The methods and organization of the researches

We have analyzed parents' opinions, morpho-functional state and medical documentation of 553 pupils of comprehensive schools (Obolonskiy district, Kyiv) and 538 pupils of Schetsyn (Zakhidnopomorskiy district) and Konin (Velykoposkiy district). Parents of all children signed written permission for access to medical records of their children.

For achievement of our purpose we worked out diagnostic complex for examination of health state and physical condition (estimation of possible after-effects of upper air-passages' diseases against the background of season virus infections). Research complex included questionnaire, in which parents answered 38 questions and the answers to which gave information about day regime of a child, level of his (her) physical activity. Besides, we executed main anthropological measurements in the course of our research (mass of body, height, chest circumference at inhale and exhale), Genchi's and Shtange's tests; we registered heart beat frequency in rest, systolic and diastolic BP.

Foe estimation of organism's adapting ability we used adaptation potential, which was determined as per methodic of R.M. Bayevskiy (1988) by formula:

$$BP = 0,011\text{-}HBF * 0,014\text{-} BPs * 0,008\text{-} BPd + 0,014*A + 0,009\text{-} BM - 0,009* H -0,27,$$

where:
HBF – heart beat frequency (b.p.m.);
BPs systolic BP, (mm. of merc, col.);
BPd diastolic BP, (mm. of merc, col.);
A – age, years;
BM – mass of body, kg;
H – height, cm;

Standard vital capacity of lungs was calculated by formula:

For girls: [height * 0.041 – age * 0.018]- 3,7

For boys: [height* 0.052 – age * 0.022]- 4,6

Dependence between weight and height was determined with the help of index BMI (klg.p.m^2) by formula:

BMI = Body mass, kg / height^2, м^2 .

For statistical processing of the obtained results we used method of mean values and rank correlation coefficient of Spirman (as per L.Ye. Poliakov 1971) [11]. This is non-parametric method, which is used for determination od statistic connection between phenomena. In this case actual degree of parallelism between two quantitative rows of the studied properties is determined and estimation of closeness of the determined connection is given with the help of quantitatively expressed coefficient.

With the help of rank correlation coefficient, conventionally closeness of connection between properties is evaluated with assuming that coefficient equal to 0.3 and less is an indicator of weak connection; value more than 0.4 but less than 0.7 – moderate closeness, value 0.7 and more – means high closeness.

Results of the researches

Analysis of the studied parameters showed that passport data and anthropometrical indicators of examined children in Poland and in Ukraine practically do not differ (see table 1). However there were registered some differences when evaluating such indicators as: pause after inhale and heart beat frequency in rest, which had trend to approaching standard among children from Poland in contrast to their peers from Ukraine (see table 1).

Table 1

Passport data and functional state of cardio-vascular and respiratory systems of the examined children

Indicators	Poland	Ukraine	Total
Quantity of examined children	553	538	1091
Sex, male /female, %%	62.41/37.4	58.0/52.0	62.4/37.4
Age, years	7.985±1.148	8.054±0.926	8.325±1.124
Height, cm	133.958±10.638	134.939±9.669	134.209±10.371
Mass of body, kg	32.134±7.799	33.344±7.699	32.434±7.689
BMI, kg/m^2	17.901±1.201	18.310±1.241	18.02±1.351
Standard vital capacity of lungs, l	1.524±0.245	1.489±0.279	1.482±0.243
Breathing pause at inhale, sec	28.000±14.651	23.327± 14.524	25.515±7.847
Breathing pause at exhale, sec	20.938±11.658	12.000±4.630	19.050±12.466
Chest circumference at inhale, cm	67.802±3.615	68.871±3.800	67.365± 4.290
Chest circumference at exhale, cm	57.025±2.701	59.601±3.374	58.666±2.652
Heart beat frequency, b.p.m.	76.025±12.112	92.212±14.804	80.752± 14.858
Systolic BP, mm of merc. col.	105.45±10.45	98.12±9.57	99.97±11.01
Diastolic BP, mm of merc. col.	65.74±6.57	60.47±1.24	63.45±5.71
Index of adaptation potential (as per methodic of R.M. Bayevskiy 1988)	3.177±0.282	3.231±0.323	3.193±0.295

Special attention should be paid to value of Bayevskiy's index in both groups of the tested, which characterizes level of organism's functional adaptation. Functional reserves are a range of possible changes of physiological systems' functional activity, which can be ensured by organism's activation mechanisms. The most important role in organism's vital activity is played by vegetative nervous system. Vegetative disorders manifest with emotional stresses, because they are, first of all, reserves of regulatory and self-regulatory mechanisms, which ensure adaptation to environmental factors. Payment for adaptation, which outcomes the frames of organism's reserves' possibilities, results in malfunctioning of adaptation mechanism and appearance of steady pathological changes. For diagnostics of vegetative changes they use, first of all, parameters of cardio-vascular system, on the base of which they determine the level of organism's functional adaptation – adaptation potential. Though we did not find any confident differences in both groups of the tested ($p > 0.05$), mean values of adaptation potential by Bayevskiy in group of Ukrainian children can be interpreted as pointing at insufficient adaptation level (as per Bayevskiy – 3.21 – 4.3), which is characterized by reduction of organism's functional abilities in adaptation to continuously varying environment. Mean values of the same indicator of Polish children are at low limit of level and it witnesses about straining of adaptation mechanisms (as per Bayevskiy – 2.11 – 3.2). Straining of adaptation mechanisms as per Bayevskiy is achieved by sufficient organism's functional abilities at the account of re-distribution of its functional reserves (see table 1).

Analysis of children's sleeping regime showed that only 32.75% of Ukrainian children and 36.02% of Polish children have sufficient, as per hygienic standards for their age, duration of night sleep (10 hours). Other children (from the words of their parents) sleep less time – 8 hours (35.67% - Poland; 29.26% - Ukraine) and 9 hours (20.02% - Poland and 23.64% - Ukraine). With it, 70.26% of Poland children's parents and 72.51% of Ukrainian children's parents consider duration of their children's night sleep to be sufficient.

Indicator of quantity of children, who do morning exercises (ME), is also critical: 8.32% - Poland; 8.15% - Ukraine. The main reason of not doing ME is determined by these children's parents as their insufficient self-discipline (39.85% - Poland; 33.09% - Ukraine).

Main health-related means, which harden children, in opinion of their parents are: swimming pool (20.42% - Poland; 16.24% - Ukraine), swimming in river or in lake in warm seasons (9.84% - Poland; 10.89 % - Ukraine), and sun-bathing on beach in summer nearly every day (8.99% - Poland and 11.25% - Ukraine). With it, in average 25% of Polis and Ukrainian children spend from 1 to 4 hours every day in the open air.

Didactic classes take most of time of modern junior pupil. In average they are 4-5-6 didactic hours a day, except Fridays, in which approximately 75% of parents declared 4-5 hours classes. Besides, 23.54% Ukrainian parents and 20.34% of Polish parents noted participation of their children in optional classes on Saturdays.

Domestic work also takes both Ukrainian children (36.79 and 47.68% accordingly) and their Polish peers (32.58 and 52.36% accordingly) in average 1-2 hours every day.

Traditional preparation of home tasks in exact sciences takes the most of time in both tested groups (48.97% - Poland; 40.98% - Ukraine). 82.70% of all questioned parents consider mental load on their children to be moderate and only 3.63% of Polish parents and 5.32% of Ukrainian parents note that it is excessive.

With analyzing children's eating schedule, it should be noted that most of parents noted 4-5 times eating of their children. Most of Ukrainian parents mentioned 4-times eating of their children (38.98%), while Plosh parents mention 5-times eating (52.49%).

Unfortunately physical activity in the form of sports trainings takes only 17.05% of spare time of the questioned. As it was mentioned above 25.13% of Polish children and 24.58% of Ukrainian children spend free time walking in the open air and communicating with friends. However, substantial part of free time of the questioned children is taken by watching TV (23.44% -Poland; 19.56% - Ukraine) and computer games (8.65% - Poland and 6.08% - Ukraine). The same activity takes most of time in days off. If in average watching TV in days off takes 13.48% of the tested children (14.97% - Poland and 12.59% - Ukraine), then only 6.37% of the questioned parents declare sports trainings as main mean of spending leisure time as days off. With it, parents of the tested children (90.97%) consider that motion activity's level of their children is generally normal for their age. Restrictions of children's motion activity are realized only by recommendation of doctor – 69.70%. In Poland parents restrict motion activity of their children in 12.12% of cases; by recommendation of physical culture instructor – in 12.12% of cases. In Ukraine it was difficult for parents to answer to what extent and when they restrict children's motion activity after recovering from respiratory organs' diseases.

Among tested children the following kinds of sports are the most popular: swimming (28.7% - Poland; 14.98% - Ukraine), football (22.22% - Poland; 20.98% -Ukraine), track and fields (14.97% - Poland; 20.99% -Ukraine), martial arts (11.7% - Poland; 13.69% -Ukraine).

When fulfilling physical exercises 65.41% of children did not have any unpleasant sensations. With it, in average, physical activity of 4.51% of children caused short breath (3.98% - Poland; 4.87% - Ukraine), of 4.59% - coughing (4.54% - Poland; 3.99% - Ukraine). Other disorders, connected with functioning of respiratory organs, were not noted. With it, examination showed that parents of the tested children understand completely that physical activity is an integral part of healthy life style and it was demonstrated by percentage of their answers to question "Would you like to choose from below given answers the one, you agree with?" (See table 2).

It should be noted that parents themselves observe relatively sound way of life. 82.71% do not smoke. From 71,98% of smoking parents nobody do it in the presence of their children.

Analysis of frequency of respiratory system's morbidity of the tested children showed the following: 15.78% of parents noted that their children had not been suffered from respiratory system's diseases for the last academic year. 30.08% of all respondents noted that their children were sick twice a year (30.99% - Poland; 32.65% -Ukraine). Children of 12.78% of parents were sick one a year (14.97% - Poland; 11.96% -Ukraine). And at last children of 14.29% of parents were sick three times a year (13.03% - Poland; 15.97% -Ukraine).

Table 2

Opinion of the tested children's parents about role of physical activity in human life

Would you like to choose from below given answers the one, you agree with (you may chose several variants):	Poland	Ukraine	Total
Physical activity's trainings are necessary, because they maintain physical condition	25.29	29.63	27.33
Physical activity's trainings are important because they bring enjoyment	29.47	23.36	25.28
Physical activity's trainings are necessary for health protection	23.99	24.52	24.15
Physical activity's trainings can be dangerous for health		.	1.59
Physical activity's trainings permit to avoid excessive weight	21.54	19.58	20.96
Physical activity's trainings are necessary for those, who are going to become professional sportsmen			0.68

As per analysis's data of medical records of the tested children acute virus infection of upper air passages was the main reason of children respiratory organs' diseases in Poland and in Ukraine. General structure of respiratory system's morbidity of the tested children is given in table 3. The most often there were such clinical forms of respiratory organs' diseases as: catarrhs of nose and larynx, inflammation of tonsils, vocal cords, bronchi, lungs (see table 3).

In average, duration of diseases was from 4 to 7 days. 28.56% were sick 6-7 days (28.04% - Poland; 29.33% - Ukraine). In average 19.54% were sick for five days (19.99% - Poland; 18.70% -Ukraine). 10.52% of children were sicj 4 days (11.69% - Poland; 9.95% - Ukraine).

Table 3

Structure of respiratory system's morbidity of the tested children (1657 cases per 1091 children)

Description of disease	Poland	Ukraine	Total
Bronchial asthma	0.75	0.59	0.61
Chronic bronchitis	1.04	1.98	1.21
Acute bronchitis	10.09	15.36	11.52
Nasal catarrh	43.69	45.11	44.24
Larynx catarrh	15.87	11.08	12.12
Quinsy	13.64	12.89	13.02
Pneumonia	4.25	4.99	4.85
Inflammation of vocal cords	8.04	9.21	8.48
Other	1.28	1.15	1.25

Favorable effect of special physical exercises' application after diseases of respiratory system is also unknown to sick children's parents both in Poland and Ukraine. For example, 54.89% of all respondents do not know about positive influence of breathing exercises after children's diseases of respiratory organs (53.66% - Poland, 55.02% - Ukraine). Only one third part of the questioned respondents pointed that their children can fulfill simple breathing exercises (32.00% - Poland, 33.30% - Ukraine). With it, 81.21% of respondents would have liked their children to be able to fulfill breathing exercises. And they would have liked that these exercises would be of dynamic character (31.47% - Poland, 30.03% - Ukraine): sound gymnastics with singing elements (24.89% -Poland, 29.27% -Ukraine), static dynamic breathing exercises (19.09% -Poland, 21.99% -Ukraine) and elements of Yoga (15.69% -Poland, 17.98% - Ukraine).

Estimation of some respiratory system indicators' dependence on 7-9 years old children's life style with method of Spirman's rank correlation (level of confidence $p < 0.05000$, $n = 1091$) showed that strong direct dependence exists only between application of hardening health related means and value of chest circumference at inhale (see table 4). Discomfort during fulfillment of physical exercises and frequency of 5respiratory organs' morbidity on the one hand and time of breathing pause after exhale on the other hand were in reverse (negative) moderate interconnection (see table 4). Child's ability to fulfill elementary breathing exercises is moderately positively connected with time of breathing pause after exhale and chest circumference at inhale (see table 4).

Table 4

Estimation of some respiratory system indicators' dependence on 7-9 years old children's life style with method of Spirman's rank correlation (level of confidence $p < 0.05000$, $n = 1091$)

Indicators	Application of hardening means	Frequency of respiratory organs' morbidity	Child's ability to fulfill breathing exercises	Discomfort at physical loads
Breathing pause after exhale, sec.	-	- 0.493	0.303	- 0.610
Chest circumference at inhale, cm	0.758		0.501	-

Human life and health is the main value of society. Health is the factor without which a person can not be happy. Health can be only formed, acquired by means of heavy purposeful work and obtaining knowledge - knowledge of life style principles, order of life activity, which would preserve and even strengthen health, instead of destroying it. Children are the future of any state, the prospects of its economic, social and spiritual development.

Health has always being been the main factor of nation's security. Task of pupils' health improvement can not be solved only by medical workers' efforts. Health shall be one of results of education.

One of main tasks of modern society is creation of such educational system, which would prepare not only educated, cultural person but would preserve and develop health.

School is life space of a child, in which he (she) spends about 70% of time, that is why just school shall give knowledge and skills to organize life, to make diagnosis, to protect and improve child's health. With it, it is necessary to consider social-economic, ecological, climate and other regional and individual conditions, in which a child is educated.

As our researches have shown inadequate rest, reduction of motion activity, reduction of daily physical load are closely connected with children's morbidity of respiratory organs.

According to data of Ministry of health protection of Ukraine, as on to day 90% of pupils have health abnormalities and more than 50% - insufficient physical condition.

For last five years morbidity of 7-14 years old children increased nearly by 35%. There is a trend to reducing of quantity of healthy pupils from 33% (first form) to 6-9% (senior forms). General infantile disability also is growing [3, 8].

In world structure of infantile morbidity second place is taken by diseases of respiratory organs – 22.7% [8].

Analysis of children's health state in Ukraine and countries of European Community proves that prospecting of educational methods, forms of their organization, considering preservation and strengthening rising generation's health

are of special importance for all states. Successful achievement of this purpose is possible only with methodic, complex and agreed work of parents, pedagogues, medical workers, lawyers and sociologists. .

There are different definitions of health and approaches to its preservation and strengthening in ethno-pedagogic.

As per definition of World health protection organization "health" is state of full physical, psychic and social welfare, but not simply absence of diseases or physical defects".

Education can be maximally effective and minimally traumatic for child's psychic only if it is strictly coordinated with age physiological and psychological abilities, when pedagogue considers inherited potential of personality. Education shall be oriented on organism's abilities to resist stresses and these abilities are nothing but health.

Human health is ability to maintain suitable for age and sex psycho-physiological stability in conditions of continuous change of quantitative and qualitative units of structural and sensor information.

Health reflects quality of organism's adaptation to environmental conditions, is a process of human interaction with environment; state of health is formed as a result of interaction of external (natural, social) and internal (heredity, sex, age) factors.

If to take conventionally health level as 100% then 20% depend on inherited factors, 20% - on social-economical and ecological conditions, 10% - on activity of health protection system, 50% depend on a person himself, on his (her) life style [1, 3, 8].

Life style is a bio-social category, which characterizes human life activity, his (her) labor), domestic conditions, forms of material and spiritual demands' satisfaction, rules of individual and social behavior. That is, life style – is "face" of an individual, which reflects also the level of social progress [4, 9].

As per modern conceptions, "healthy life style" includes the following [12]:

– Optimal motion regime;
– Rational eating; загартовування;
– Personal hygiene;
– Positive emotions;
– Rejection of harmful habits (smoking, using alcohol, drugs).

Health of adult person is formed in his childhood and to large extent depends on healthy life style.

Conclusions:

1. Analysis of literature data showed that unfortunately only from 2.8% to 11.9% of children can be considered to be healthy; 53-64% of children have chronic pathologies. With it, pathological processes increased from junior to senior forms. It should be noted that more than 40% of children entered school with already formed chronic diseases.

2. It was found that motion activity's level of most of children in Ukraine and Poland does not correspond to standard norms, required for ensuring proper physical health.

3. It was established that at school correlation 28 hours of general subjects to 2 hours of physical culture weekly witnesses about not observance of physiological dozing standards of mental and physical loads in period of children organism's development and growth. Deficit of motion activity of young organism of 7-17 years old is 60-75% form the required for health preservation and development of physical condition.

Basing on all above mentioned, in order to correct health state of children after respiratory system's diseases we came to conclusion that it is necessary to create adequate program of physical culture classes, which would consider not only such components as quantity of exercises' repetitions, their intensity, duration of breaks between exercises, but would actively include elements of therapeutic physical culture (kinesio-therapy). The greatest attention should be paid to such kinds of motion activity, which have therapeutic effect and are the most popular among parents and their children, i.e. static and dynamic breathing exercises, sound gymnastics, elements of Yoga.

The prospects of further researches. Importance of this problem conditions demand in new understanding of situation and development effective approaches to increasing of motion activity, preservation and strengthening of children's somatic health. But effectiveness of the methods to be applied shall depend not only on character of muscular activity, but also on level of adaptation mechanisms' and main organism's functional systems' development. The prospects of further researches imply solution of the mentioned problems.

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