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Dust Storms Health Effect in Diyala Province

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Dust Storms Health Effect in Diyala Province

Abstract

Background: A dust storm is a meteorological phenomenon that arises when a storm front blows loose sand and dust off the surface of an arid or semiarid landscape. Soil particles are mass-transported by saltation and suspension, causing erosion from one place and deposition in another. Some countries are geographically situated in a position that sand and dust storms (SDS) often stuck with them. Unfortunately, Iraq is one of those countries where dust storms hit and last for days. Iraq's summer time climate is hot, dry, and dusty. Dust storms in the Middle East occur on the plains of Iraq and Kuwait and have possible health implications. Much dust is lofted off the Tigris-Euphrates alluvial plain. We conducted this To identify the impact of dust storms on the health of the people living in Diyala provinice in Iraq.

Aims of study: to identify the dust storm health effect in Diyala province.

Patients and methods: A Cross sectional study , done in Baqubah Teaching Hospitals and Al Batool teaching hospitals from 1st October 2022 to 31th march 2023, two hundred patient were collected randomly .We conducted the study using a prepared written questionnaire.

Results: 60.5% of them suffered at least one time shortness of breath, 68% of the suffered from sneezing, 49.5% of them have runny nose and 35.5% of them have sore throat. 54% of them experienced eye itching, 49.5% have redness in eyes and 52% have teary eyes. 42% of them suffered skin irritations and 55.5% complained from skin dryness during the storms. 55.5% of them think that the sand and Dust storms inhibit their performance at work and decrease their productivity and 72% have bad mood during storms.17% suffered from severe vertigo during the attacks.

Conclusion: dust and sand storms have major impact on general health of the people.

Keywords: dust storm, sand storm, Diyala.

Introduction

A dust storm is a meteorological phenomenon that arises when a gust front blows loose sand and dust off the surface of an arid or semiarid landscape. Soil particles are mass-transported by saltation and suspension, causing erosion from one place and deposition in another [1].

Dust particles vary greatly in size. The largest are coarse particles, defined here as particulate matter ranging between 2.5 and 10 microns in aerodynamic diameter and commonly denoted by $PM_{2.5–10}$. Fine particles ($PM_{2.5}$) with aerodynamic diameter less than 2.5 mm are considered to be much more harmful. $PM_{2.5}$ has frequently been the focus of air pollution and health studies. Smaller still are the ultrafine particles ($PM_{0.1}$), with an aerodynamic diameter less than 0.1 mm. In a dust storm, the predominant fraction tends to consist of coarse particles,11 or the coarse fraction of PM_{10} (expressed as $PM_{10}–PM_{2.5}$). The adverse effects of coarse particles on morbidity and mortality have also been documented in several time series studies [2,3].

Some countries are geographically situated in a position that sand and dust storms (SDS) often stuck with them. Unfortunately, Iraq is one of those countries where dust storms hit and last for days. Iraq's summertime climate is hot, dry, and dusty. Dust storms are driven by a northwest wind called the "Shimali" (means in Arabic language; from the north) that can rip through the Tigris and Euphrates River valleys of central and southern Iraq at any time of the year, and blow almost

constantly through June and July. However, in August and September it might still blow. Shimali winds can last for several days in a row, strengthening during the day and weakening at night, and creating devastating dust storms [4].

Several studies conducted to investigate the role of dust storms that consists of concentrated crustal particulates have shown an associated allergic, asthma, and silicosis/ pulmonary fibrosis risk. Areas impacted by desert dust storms, such as communities in the Middle East, were known to have some of the highest incidences of asthma on the planet, as it was determined that the incidence of asthma increased between 1973 and 2004, due to the increasing dust storms in the Middle East region [5].

Dust storms in the Middle East occur on the plains of Iraq and Kuwait and have possible health implications. Much dust is lofted off the Tigris-Euphrates alluvial plain, the Jaz Murian depression and the Seistan Basin. In Tehran, the great bulk of particulates are derived from the deserts of Iraq and Syria, while some dust in the United Arab Emirates may be derived from Iran and central Asia [6].

The pathogenic effect of dust inhalation on respiratory tissues can be attributed to the direct physical action of dust particles on the epithelium of the human airways and may be exacerbated by the toxic effects of both trace elements (including arsenic) and of biologically active compounds[7]. Studies in East Asia have related ADEs to asthma, pneumonia and tracheitis. *Tao et al*., working in Lanzhou, China, found that dust storms led to increased respiratory hospitalizations, particularly for those aged >65 [8].

Aims of study.

To identify the dust storm health effect in Diyala province .

Patient and methods.

A Cross sectional study , done in Baqubah Teaching Hospitals and Al Batool teaching hospitals from 1st October 2022 to 31th march 2023. Tow hundred patient were collected randomly . age group > 10 years to 60 years. We conducted the study using a prepared written questionnaire. We asked patients face to face using questions contain age, gender , occupations , the effects of the dust storms on their health condition and their daily life.

Statistical analysis

The data collected and analysis using laptop and use Statistical package for social sciences (SPSS) version 26 . We used the arithmetic mean and stander deviation to express the quantitative date and we used the frequencies percentile .

Results

Two hundred patient were included in this study. Their mean age was 31.2±12.35 years and they were 110 males (55%) and 90 females (45%). Their occupation were students (33.5%), employees (25%) as shows in table 1.

Table 1. Occupations of the patient

Occupation	No.	%
Students	67	33.5
workers	31	15.5
Housewives	40	20.0
Retireds	12	6.0
Employees	50	25.0
Total	200	100.0

In the following tables we will show the health issues they suffered during the dust and sand storms.

Table 2. Respiratory health effect of dust storms

Complications	No.	%
Shortness of breath	121	60.5
Sneezing	136	68
Runny nose	99	49.5
Attacks of asthma	54	27
Sore throat	71	35.5

Table 2 show that the (60.5%) of the patient had at least one episode of SOB during sand storms, (68%) complained from sneezing,(49.5%) of them had runny nose, 27% suffered asthma attacks and 35.5% had sore throat.

Table 3. Eye health effect during dust storm

Complications	No.	%
Eye redness	99	49.5
Eye itching	108	54
Eye tearing	104	52

Table 3 show that (49.5%) of the patient suffered from eye redness, 54% from eye itching and (52%) from eye tearing**.**

(42%) of the patient complained from skin itching during the sand storms and (55.5%) from skin dryness as in table 4.

Table 4. Dermatological health effect of dust storms

Complications	No.	%
Skin irritation	84	42
Skin dryness	111	55.5

Table 5 show that (55%) of the patient had decrease in their productivity during the sand storms, (72%) suffered from mood changes,(72%) suffered an impact on their physical activity, (17%) suffered vertigo and (25%) suffered from headache.

Table 5. Mental and neurological health effect of dust storms

Complications	No.	%
Impact on productivity and performance	111	55.5
Mood changes	144	72
Impact on physical condition	144	72
Vertigo	34	17
Headache	50	25

Discussion

Dust storms are natural hazards and the most common sources of natural particles, including very small materials, potential allergens, and pollutants. Depending on the nature of the source of the dust, these materials and substances may include, quartz, silicon dioxide, oxides of magnesium, calcium, iron, and aluminum [9].

This study impact of dust and sand storms on the health condition and common health issues in the community. The majority of the patient was students (33.5%), the employees (25%) the housewives (20%), the free workers (15.5%) and finally the retired (6%).

We found 60.5% of them suffered at least one time shortness of breath, 68% of the suffered from sneezing, 49.5% of them have runny nose and 35.5% of them have sore throat and that agree with the findings of study done in KSA *Al-angari et al.* [10].

Fifty four percent of them experienced eye itching, 49.5% have redness in eyes and 52% have teary eyes which agree with the findings of study done in Monogolia *Mu et al.* [11].

Forty tow percent of them suffered skin irritations and 55.5% complained from skin dryness during the storms and our fundings agree with the findings of study done in China *Zhang et al.* [12].

Fifty five and half percent (55.5%) of them think that the sand and Dust storms inhibit their performance at work and decrease their productivity and 72% have bad mood during storms. 17% suffered from severe vertigo during the attacks and this agree with the findings of study done in South Korea *Lee et al.* [13].

Conclusion

We conclude that particle dust storm contains microbial agents that account for the most common exposure to respiratory, eye , dermatological ,mental and neurological complication.

Recommendations

1-Not to go outside during the sand storm.

2-Usage of masks and other protective measures.

3-Going to hospital to get professional health care especially the asthmatic patients.

4-Further study in largest sample size .

5-Specific health prevention advice should be offered to all people affected by these storms (particularly elderly and children with chronic lung and heart illnesses) .

6-strategic management of water bodies and planting new species of plants could be effective to mitigate the impact of desert dust on respiratory conditions.

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اوصي باستلام وقبول بحث التخرج للطالبة سارة احمد حسين بعد اكمالها متطلبات البحث كاملة ودون اي نقص وإكمالها جميع الاحصائيات والتعديلات المطلوبة منها .

أ.د.شهاب احمد شاكر

تأثير عاصفة الغبار على الصحة في ديالى

خلاصة البحث

الخلفية : العاصفة الترابية هي ظاهرة أرصاد جوية تنشأ عندما تهب عاصفة أمامية من الرمال والأتربة السائبة عن سطح منطقة قاحلة أو شبه قاحلة. يتم نقل جزيئات التربة بكميات كبيرة عن طريق الملوحة والتعليق ، مما يتسبب في تآكل من مكان وترسب في مكان آخر. تقع بعض البلدان جغرافيًا في موقع تتعثر في كثير من الأحيان. ولسوء الحظ فإن العراق من البلدان التي (SDS) فيه العواصف الرملية والترابية ضربتها عواصف ترابية وتستمر لأيام. مناخ العراق الصيفي حار وجاف ومغبر. تحدث العواصف الترابية في الشرق الأوسط في سهول العراق والكويت ولها آثار صحية محتملة. تم رفع الكثير من الغبار عن سهل دجلة والفرات الغريني. أجرينا هذا للتعرف على تأثير العواصف الترابية على صحة سكان محافظة ديالى في العراق.

المرضى والأساليب : دراسة مقطعية اجريت في مستشفى بعقوبة التعليمي ومستشفى البتول التعليمي من ١ تشرين الاول ٢٠٢٢ الى ٣١ اذار ٢٠٢٣ . تم جمع مائتي مريض بشكل عشوائي. اجرينا الدراسة باستخدام استبيان معد مكتوب.

النتائج : ٦٠,٥٪ منهم عانوا من ضيق تنفس لمره واحدة على الاقل , ٦٨٪ عانوا من العطاس , ٤٩,٥٪ منهم عانوا سيلان الانف , ٣٥,٥٪ منهم مصابون بالتهاب الحلق . ٥٤٪ منهم يعانون من حكة في العين , ٤٩,٥٪ لديهم احمرار في العين , ٥٢٪ عيون دامعة . عانى ٤٢٪ منهم من تهيج جلدي , ٥٥,٥٪ اشتكوا من جفاف الجلد خلال العواصف .يعتقد ٥٥,٥٪ منهم ان

العواصف الرملية والترابية تثبط ادائهم في العمل وتقلل من انتاجيتهم , ٧٢٪ يعانون من مزاج سيء اثناء العواصف , و ١٧٪ يعانون من دوار شديد اثناء العواصف .

الستنتاجات : العواصف الترابية لها تاثير كبير على الصحة العامة للناس.

الكلمات المفتاحية : عاصفة ترابية ,عاصفة رملية , ديالى .

وزارة التعليم العالي

والبحث العلمي

جامعة ديالى

كلية الطب

تأثير عاصفة الغبار على الصحة في محافظة ديالى

بحث مقدم الى مجلس كلية الطب , جامعة ديالى , استيفاء جزئي لمتطلبات البكالوريوس في الطب والجراحة العامة.

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