INTRODUCTION
Cardiovascular disease (CVD) is one of the five global leading causes of total years of life lost in 2016 [1]. Dyslipidemia is a well-established risk factor of CVD amounting to more than half of the global cases of coronary artery disease [2,3]. Its prevalence has increased over a period of 20 years among the urban population in India [4]. Rapid urbanization, rural-to-urban migration, poor dietary habits, physical inactivity, sociocultural factors, and genetic predisposition all contribute to dyslipidemia [5]. The WHO Study on Global Aging and Adult Health carried out among 39,436 adults during 2007–2010 revealed that rural–urban migrants had a higher awareness of health behavior regardless of previous life experiences [6]. This study was carried out to assess the prevalence of dyslipidemia among the elderly in slums of West Delhi.

METHODS
A cross-sectional study was carried out in slums of West Delhi covering a total of 234 elderly aged 60 and above. 5 ml blood was collected from 103 elderly and was analyzed for serum total cholesterol, triglyceride, high-density lipoprotein (HDL) cholesterol, and low-density lipoprotein (LDL) cholesterol by enzymatic method using fully automatic analyzer (Roche Hitachi-902). Dyslipidemia was defined using the National Cholesterol Education Program, ATP-III guidelines [7].

RESULTS
The overall prevalence of high cholesterol (≥200 mg/dl), high triglyceride (≥150 mg/dl), low HDL cholesterol (male <40 mg/dl; female <50 mg/dl), and high LDL cholesterol (≥130 mg/dl) was 20.39%, 45.63%, 64.08%, and 17.31%, respectively.

DISCUSSION
Our study indicated overall prevalence of high cholesterol (≥200 mg/dl), high triglyceride (≥150 mg/dl), low HDL cholesterol (male <40 mg/dl; female <50 mg/dl), and high LDL cholesterol (≥130 mg/dl) was 20.39%, 45.63%, 64.08%, and 17.31% (Table 2). Prevalence of dyslipidemia was higher in females compared to male elderly.

Low HDL cholesterol was the most common among the elderly in our study. The Indian Council of Medical Research-India Diabetes
study carried out among adults in Tamil Nadu, Maharashtra, Jharkhand, and Chandigarh also reported the prevalence of low HDL cholesterol (72.3%) as the most common dyslipidemia compared to hypercholesterolemia (13.9%), hypertriglyceridermia (29.5%), and high LDL cholesterol (11.8%) [11]. A recent survey of the National Nutrition Monitoring Bureau Survey carried out by the Indian Council of Medical Research in urban areas indicated that more than 20% of adults had total cholesterol ≥200 mg/dl and LDL cholesterol ≥130 mg/dl, while around 40% of men and 28% of women had triglycerides ≥150 mg/dl and about 74% of men and 82% of women had low HDL cholesterol <40/50 mg/dl [12].

The concentration of cholesterol increases until 45–55 years of age in men, while for women, it continues increasing and only declines in the last decade of life [13]. A cross-sectional study carried out among 5375 adults in China also revealed peak prevalence of dyslipidemia in men between 30 and 39 years with a gradual decline as age increases, while in women, the prevalence of dyslipidemia increased with age and peak prevalence occurs after the age of 60 [14]. Menopause leads to changes in hormonal status and lipid profile in women by resulting in increased total and LDL cholesterol and reduced HDL cholesterol [15]. Our study also revealed a higher prevalence of dyslipidemia among elderly female compared to male. A study carried out among in rural Thailand also reported that women had significantly higher cholesterol and LDL cholesterol levels than men [16].

CONCLUSION

Low HDL cholesterol and high triglyceride were the most form of dyslipidemia among the elderly. Awareness on dietary and lifestyle modification for management of dyslipidemia needs to be imparted.

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AUTHORS CONTRIBUTIONS

- Zaozianlungliu Gonmei: Data collection, data analysis, interpretation of data, and paper writing
- Supriya Dwivedi: Data collection, data analysis, interpretation of data, and paper writing
- Dr. Gurudayal Singh Totija: Conceptualization of study, interpretation of data, and finalization of manuscript
- Dr. Karuna Singh: Conceptualization of study and interpretation of data
- Dr. Naval Kishore Vikram: Conceptualization of study and interpretation of data
- Dr. Priyanka Gupta Bansal: Conceptualization of study and interpretation of data
- Sunan Rathore: Interpretation of data.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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Table 1: Mean±SD and median serum levels of total cholesterol, triglyceride, HDL cholesterol, and LDL cholesterol of elderly

| Parameters               | N  | All | N  | Male | N  | Female |
|--------------------------|----|-----|----|------|----|--------|
| Total cholesterol (mg/dl)| 103| 68.86| 171| 56   | 162.11| 163.74 |
| Triglycerides (mg/dl)    | 103| 162.5| 143.0| 56 | 144.81| 116.15 |
| HDL (mg/dl)              | 103| 43.89| 39.51| 56 | 41.9| 41.1 |
| LDL (mg/dl)              | 52 | 105.60| 109.00| 21 | 96.05| 98.00 |

HDL: High-density lipoprotein, LDL: Low-density lipoprotein

Table 2: Prevalence of dyslipidemia in the elderly

| Parameters               | N  | All | N (%) | N  | Male | N (%) | N  | Female | N (%) |
|--------------------------|----|-----|-------|----|------|-------|----|--------|-------|
| Total cholesterol ≥200 mg/dl| 103| 21 (20.39)| 56 | 9 (16.07)| 47 | 12 (25.53)|
| Triglycerides ≥150 mg/dl  | 103| 47 (45.63)| 56 | 19 (33.93)| 47 | 28 (59.57)|
| HDL cholesterol (M - <40 mg/dl; F - <50 mg/dl)| 103| 66 (64.08)| 56 | 27 (48.21)| 47 | 39 (82.98)|
| LDL cholesterol ≥130 mg/dl| 52 | 9 (17.31)| 21 | 2 (9.52)| 31 | 7 (22.58)|

*Equal contribution

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Author Contributions

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