In [1]:
```
import pandas as pd
import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import seaborn as sns
%matplotlib inline
from matplotlib import style
```

In [2]:
```
adv = pd.read_csv("C://Users//kolli Mallikarjuna//OneDrive//Desktop//project data//Adv
adv
```

Out[2]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
0	1	230.1	37.8	69.2	22.1
1	2	44.5	39.3	45.1	10.4
2	3	17.2	45.9	69.3	9.3
3	4	151.5	41.3	58.5	18.5
4	5	180.8	10.8	58.4	12.9
...	...	...	...	...	...
195	196	38.2	3.7	13.8	7.6
196	197	94.2	4.9	8.1	9.7
197	198	177.0	9.3	6.4	12.8
198	199	283.6	42.0	66.2	25.5
199	200	232.1	8.6	8.7	13.4

200 rows × 5 columns

In [3]:
```
Adv = adv.rename(columns={'Unnamed: 0': 'index'})
Adv
```

Out[3]:

	index	TV	Radio	Newspaper	Sales
0	1	230.1	37.8	69.2	22.1
1	2	44.5	39.3	45.1	10.4
2	3	17.2	45.9	69.3	9.3
3	4	151.5	41.3	58.5	18.5
4	5	180.8	10.8	58.4	12.9
...	...	...	...	...	...
195	196	38.2	3.7	13.8	7.6
196	197	94.2	4.9	8.1	9.7
197	198	177.0	9.3	6.4	12.8
198	199	283.6	42.0	66.2	25.5
199	200	232.1	8.6	8.7	13.4

200 rows × 5 columns

In [17]:
```
Adv.nunique()
```

Out[17]:
```
index        200
TV           190
Radio        167
Newspaper    172
Sales        121
dtype: int64
```

In [5]:
```
Adv.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 5 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   index      200 non-null    int64  
 1   TV         200 non-null    float64
 2   Radio      200 non-null    float64
 3   Newspaper  200 non-null    float64
 4   Sales      200 non-null    float64
dtypes: float64(4), int64(1)
memory usage: 7.9 KB
```

In [6]:
```
Adv.describe()
```

Out[6]:

	index	TV	Radio	Newspaper	Sales
count	200.000000	200.000000	200.000000	200.000000	200.000000
mean	100.500000	147.042500	23.264000	30.554000	14.022500
std	57.879185	85.854236	14.846809	21.778621	5.217457
min	1.000000	0.700000	0.000000	0.300000	1.600000
25%	50.750000	74.375000	9.975000	12.750000	10.375000
50%	100.500000	149.750000	22.900000	25.750000	12.900000
75%	150.250000	218.825000	36.525000	45.100000	17.400000
max	200.000000	296.400000	49.600000	114.000000	27.000000

In [7]:
```
Adv.shape
```

Out[7]:
```
(200, 5)
```

In [8]:
```
Adv.isna().sum()
```

Out[8]:
```
index        0
TV           0
Radio        0
Newspaper    0
Sales        0
dtype: int64
```

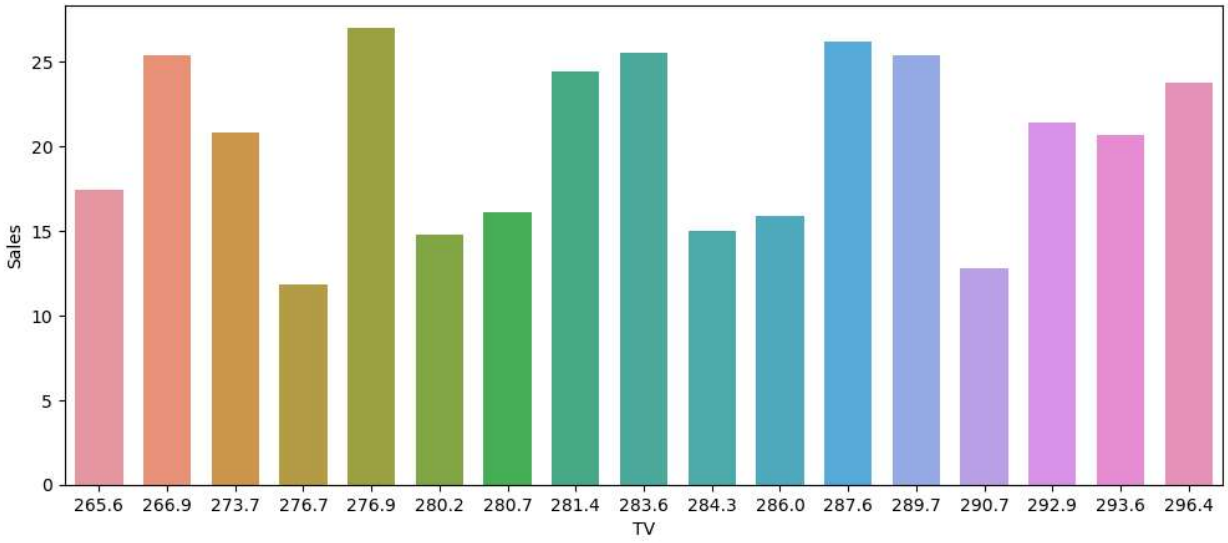
In [23]:
```
TV_sales = Adv[Adv['TV']>200].groupby(['TV','Sales']).size().reset_index().rename(colu
TV_sales
```

Out[23]:

	TV	Sales	entries
0	202.5	16.6	1
1	204.1	19.0	1
2	205.0	22.6	1
3	206.8	12.2	1
4	206.9	12.9	1
...	...	...	...
62	289.7	25.4	1
63	290.7	12.8	1
64	292.9	21.4	1
65	293.6	20.7	1
66	296.4	23.8	1

67 rows × 3 columns

In [25]:
```
matplotlib.rcParams['figure.figsize'] = (12,5)
sns.barplot(x='TV',y='Sales',data = TV_sales[50:],width = 0.7, dodge = False);
```

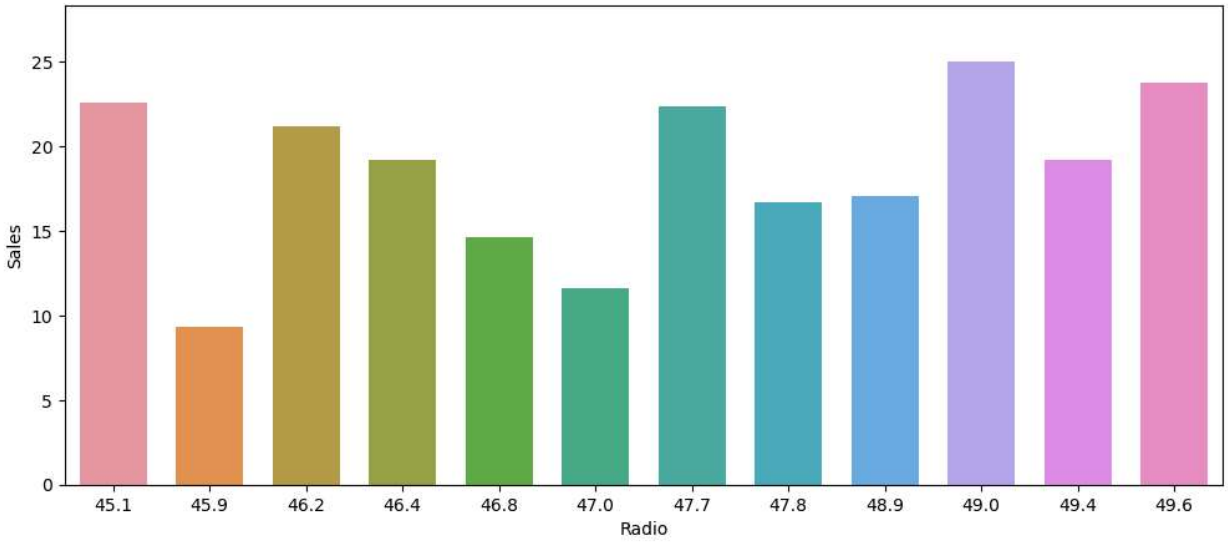


In [27]:
```
Radio_sales = Adv[Adv['Radio']>45].groupby(['Radio','Sales']).size().reset_index().rer
Radio_sales
```

Out[27]:

	Radio	Sales	entries
0	45.1	22.6	1
1	45.9	9.3	1
2	46.2	21.2	1
3	46.4	19.2	1
4	46.8	14.6	1
5	47.0	11.6	1
6	47.7	22.4	1
7	47.8	16.7	1
8	48.9	7.2	1
9	48.9	27.0	1
10	49.0	24.7	1
11	49.0	25.4	1
12	49.4	14.7	1
13	49.4	23.7	1
14	49.6	23.8	1

In [31]:
```
matplotlib.rcParams['figure.figsize'] = (12,5)
sns.barplot(x='Radio',y='Sales',data = Radio_sales,width = 0.7, dodge = False, errwidt
```

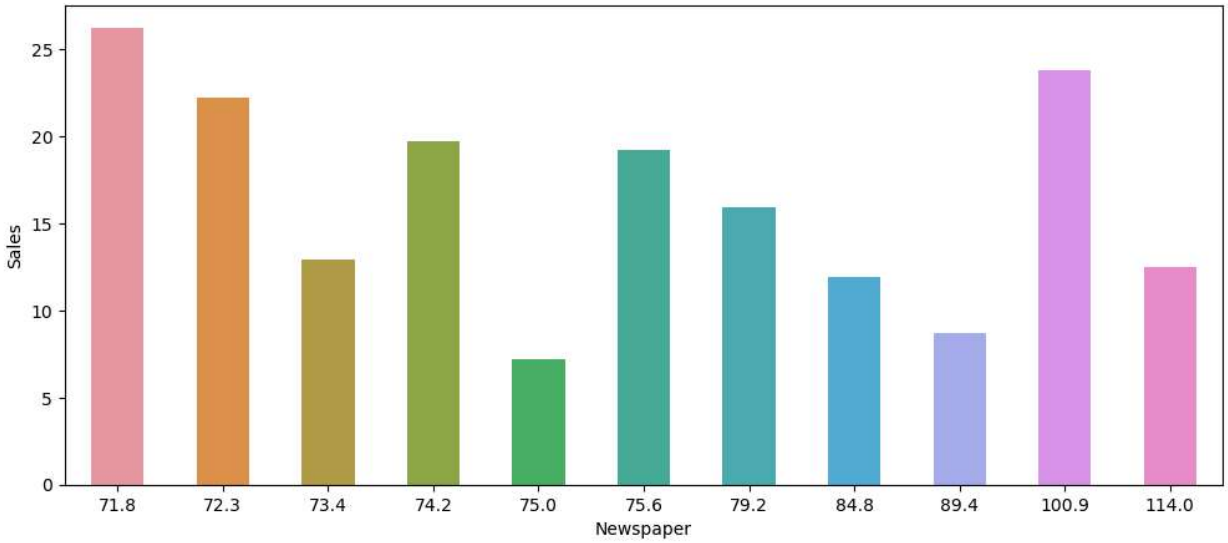


In [33]:
```
news = Adv[Adv['Newspaper']>70].groupby(['Newspaper','Sales']).size().reset_index().re
news
```

Out[33]:

	Newspaper	Sales	entries
0	71.8	26.2	1
1	72.3	22.2	1
2	73.4	12.9	1
3	74.2	19.7	1
4	75.0	7.2	1
5	75.6	19.2	1
6	79.2	15.9	1
7	84.8	11.9	1
8	89.4	8.7	1
9	100.9	23.8	1
10	114.0	12.5	1

In [35]:
```
matplotlib.rcParams['figure.figsize'] = (12,5)
sns.barplot(x='Newspaper',y='Sales',data = news,width = 0.5, dodge = False, errwidth =
```


Sales
25
20
15
10
5
0
71.8
72.3
73.4
74.2
75.0
75.6
79.2
84.8
89.4
100.9
114.0
Newspaper

In [ ]: